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IN THE

Supreme Court of the United States

OCTOBER TERM, 1944

THE STATE OF NEBRASKA, COMPLAINANT,

vs.

THE STATE OF WYOMING, DEFENDANT,

and

THE STATE OF COLORADO, IMPLEADED DEFENDANT,
THE UNITED STATES OF AMERICA, INTERVENOR.

PORTIONS OF THE RECORD CONTAINED IN APPENDICES SUBMITTED WITH BRIEFS OF PARTIES

VOL. I
PAGES 1-270

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N2 Nebraska's second brief
W1 Wyoming's first brief
W2 Wyoming's second brief
CA Colorado's appendix
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TESTIMONY OF R. H. WILLIS, CHIEF OF NEBRASKA BUREAU OF IRRIGATION, GIVEN JULY, 1936, RECORD, PAGES 621 TO 624, 626 TO 629.

Q. Did you on or about April 26, 1933, have a conference with the State Engineer of Wyoming?

A. Yes, sir.

Q. Who was the State Engineer of Wyoming at that time?

A. Mr. True—James C. True, I believe.

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JUDGE ROSE: James B.

Q. James B. True?

A. James B. True.

Q. How long had he been State Engineer at that time?

A. I don't know. I don't know just when he went in office, but he may have gone in the 1st of January of that year.

Q. Had it been long that he had been in office?

A. No. 2 or 3 months.

Q. Had he been State Engineer during the preceding irrigation season?

A. No, sir.

Q. Who went with you on this call upon Mr. True in Cheyenne?

A. C. G. Perry.

Q. And what position did Mr. C. G. Perry hold?

A. He is a special assistant attorney general.

Q. Of what State?

A. Of Nebraska.

Q. Did he have any connection with the matters dealing with irrigation?

A. Yes, special in irrigation.
Q. He was special assistant attorney general for irrigation?
A. Yes, sir.
Q. And where did he live?
A. Bridgeport, Nebraska.
Q. And still lives there?
A. What is that?

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Q. And he still lives there, does he?
A. Yes, sir.
Q. Was this conference between yourself and Mr. Perry on the one hand, and Mr. True on the other, at your request?
A. Yes, sir.
Q. How did you make arrangements for it?
A. By telephone, 2 days prior to the meeting.
Q. Now, would you tell what happened at this conference; what was said and done at the conference of April 26, 1933, at the office of James B. True, at the State House in Cheyenne?
A. Mr. Perry and myself arrived there at the office and we went into his private room and visited a little while about different subjects, and finally Mr. True said that, "I know what you are up here for. There's no need of beating around. I am ready to lay - - I want - - we will lay all of our cards on the table."

He says, "We will not administer the waters of Wyoming, of the river, for the benefit of Nebraska," or that he would not close any canals in Wyoming to benefit senior canals in Nebraska, until we have a compact.

Q. Then what further was said, and by whom?

A. Mr. Perry took part in the conversation, of course. I think I have covered the substance of the conversation. I don't recall anything of importance outside of that.

Q. Previously when you had made requests upon the State Engineer of Wyoming to close Wyoming junior canals for the benefit of Nebraska senior canals, had

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Wyoming complied with those requests?

A. No, sir.

Q. And since then they have complied, have they, with these requests?

A. No, sir; they have not.

Q. How did this conversation between yourself and Mr. Perry on the one hand, and Mr. True on the other, how did it terminate?

A. We closed the subject - - a discussion of the subject - and took up some other matters with Mr. Gleason, who was there to attend this same meeting but was late in arriving; but that was on other subjects.

Q. Was Mr. Gleason there at the time that Mr. True made the statement you have just stated?

A. No, I don't think so.

Q. In this conference, was there any mention of waste in getting the waters to Nebraska?

A. No, sir.

Q. Did Mr. True say anything about it being wasteful to get water down to the State of Nebraska?

A. No, sir; he did not.

* * *

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Q. (Mr. Good resuming) Was any mention made of the topic of an equitable apportionment to the State of Wyoming?

A. No, sir.

Q. Was any mention made of there being greater beneficial use of the waters of the Platte River in keeping the waters for Wyoming appropriators?

A. No, sir; nothing of that sort.

Q. Was there any mention made of anything about Nebraska not making the greatest beneficial use of the water?

A. No, there was not.

Q. Or that Nebraska wasted the waters?

A. No, sir.

Q. Was there a subsequent conference held in the year 1934 with the State Engineer of Wyoming?

A. Yes, sir.

Q. When was that held?

A. On July 29, 1934.

Q. And where was that held?

A. In Cheyenne.

Q. Who was there representing Nebraska?

A. There was Paul F. Good, Attorney General; R. L. Cochran, State Engineer; C. G. Perry, Special Assistant Attorney General, and myself.

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Q. What was Mr. R. L. Cochran's exact position at that time?

A. He was State Engineer on vacation at that time.

Q. And who else was there?

A. The Wyoming representatives?

Q. Yes.
A. Earl Lloyd, Edwin W. Burritt, State Engineer; Charles Gaenssler, Fred Alberts and C. F. Gleason.
Q. Mr. Gleason was also there?
A. Yes, sir.
Q. Where in Cheyenne was this conference held?
A. It was held at Mr. Burritt's home.
Q. At whose invitation?
A. We were invited to the home by Mr. Burritt.
Q. Did you call him up about where you were to meet?
A. Yes, I called him. I believe I called him from the hotel by 'phone, as I thought we were going to meet at his office, but he wasn't well that day, and invited us down to his house.
Q. Now, will you state what was said at that conference?
A. All of us had something to say at the conference, of course. The first that I had to say at the opening of the meeting was to have it understood what we were there for. That the Wyoming junior appropriators were taking water in the past whereby the senior appropriators of Nebraska were being deprived, and it seemed that we should have a better understanding. And Mr. Good then discussed the law of the river - - that is, the laws of Nebraska and Wyoming, as to priorities; and, in fact, there

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was a general discussion from the different parties.
Q. What did Mr. Burritt say?
A. Mr. Burritt said that there was no law that would permit him to recognize or deliver any water to Nebraska appropriators, or, in other words, no law to

administer water for Nebraska appropriators - - that is, no Wyoming law.

Q. Did Mr. Burritt say anything about calling someone else in?

A. Yes. Because of our talking of the law he thought that he ought to have the advice of an attorney, so he called in Mr. Greenwood. He lived only a few doors from Mr. Burritt's home.

Q. In discussing the Wyoming law, did Mr. Burritt say anything further?

A. Well, yes. After you (referring to counsel, Mr. Good) discussed the law, he said that he could not recognize appropriators of Nebraska until we either had a compact or an order of the Federal Supreme Court.

Q. Did Mr. Greenwood come?

A. Yes, he arrived.

Q. And what was said or done after Mr. Greenwood arrived?

A. Well, Mr. Greenwood said about the same - - gave the same opinion as Mr. Burritt had expressed; and he said that there was no Wyoming law that would authorize - -

Q. Speak up louder, Mr. Willis.

A. Excuse me. He said that there was no Wyoming law to authorize the State Engineer to administer water for Nebraska appropriators.

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Q. Did Mr. Cochran say anything about it at that time?

A. Yes, sir.

Q. What did he say?

A. Well, Mr. Cochran said that he expected Wyoming to recognize Nebraska appropriators because of the

implied understanding we had with Wyoming officials prior to that meeting.

Q. Did Burritt say anything in conclusion or anything about his intentions? Just state what he said.

A. Well, after saying there was no law, why he said that he would not recognize Nebraska appropriators when the Wyoming canals had need for the water.

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TESTIMONY OF C. G. PERRY THEN LEGAL ADVISER TO NEBRASKA BUREAU OF IRRIGATION GIVEN JULY, 1936, RECORD, PAGES 632 TO 636.

Q. On April 26, 1933, did you attend a conference at Cheyenne, Wyoming, which Mr. Willis also attended?

A. I did.

Q. At whose invitation did you go there?

A. At the request of Mr. R. H. Willis, chief of irrigation, water power and drainage in Nebraska.

Q. And where was this meeting held?

A. It was held in the private office of Mr James B. True, State Engineer of Wyoming, in the Capitol Building.

Q. Now, would you state what was said and done at that conference?

A. Mr. Willis and I arrived at Mr. True's office - -

* * *

A. (Witness continguing) - - the morning I think it was of April 26, 1933. We met Mr. True and shortly

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thereafter we went into his private office. Before we had a chance to be seated, Mr. True said, "I think I know what you gentlemen are here for; so there will be no beating about the bush. I will lay all the cards on the table. I will tell you frankly that Wyoming will not administer the waters of the North Platte River for the benefit of senior appropriators in Nebraska. Now, if there is anything further to discuss, we can go on with it."

Q. And was anything further said about that subject?

A. Nothing further, except that I asked Mr. True to

state his reasons, and he refused to do so.

Q. Was anything said in that conference on the subject of waste in getting the water to Nebraska?

A. Nothing.

Q. Or on the subject of an equitable apportionment of the waters of the North Platte to the State of Wyoming?

A. Nothing.

Q. Or or the subject of greater beneficial use by keeping the waters in Wyoming?

A. Nothing.

Q. Or on the subject of whether or not Nebraska made the greatest beneficial use of the water?

A. It was not mentioned.

Q. Or the subject relative to wasting of water by Nebraska?

A. There was nothing said about it.

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Q. Now, were you present at a subsequent conference or conversation in the year 1934?

A. I was.

Q. When was that held?

A. I think it was on Sunday, July 29, 1934.

Q. And where was that held?

A. It was held in the home of Mr. Edwin W. Burritt, State Engineer of Wyoming, in the city of Cheyenne.

Q. And who was present?

A. Mr. Burritt; I think there was Mr. Lloyd, Mr. C. F. Gleason, of the Reclamation Service; and I think there was a Mr. Gaenssler, and one other man whose name I do not recall; Mr. R. L. Cochran, Mr. Paul F. Good, Mr. R. H. Willis and myself; and Mr. Greenwood came in later.

Q. Now, would you state what happened at that conference, to the best of your recollection?

A. I think in the beginning it was anticipated that the meeting would be held in Mr. Burritt's office in the Capitol Building, but at his request we went out to his home.

Upon our arrival there, Mr. Willis stated briefly the purpose of the meeting, to the effect that Nebraska was making the request or demand upon the State of Wyoming to close down junior canals in Wyoming on the North Platte River for the benefit of senior appropriators in Nebraska.

After Mr. Willis had finished, Mr. Cochran talked briefly on the same subject; and Mr. Burritt then said, while he recognized - - while Wyoming recog-

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nized the law on the doctrine of priority, and he believed in it, yet there was no law that he knew of in Wyoming that would permit or authorize him to close down any canal in Wyoming for the benefit of Nebraska appropriators; and, further, that they would not be closed down as long as there was any demand made upon the water by Wyoming appropriators, regardless of their priority; and that Wyoming would not recognize any priority in Nebraska without a compact or an order of the United States Supreme Court.

At this point Mr. Good, the then Attorney General of Nebraska, arose and started to discuss the legal features of the situation; and Mr. Burritt said, "Well, the Nebraska delegates have legal representatives here, and I think that I should be represented"; and he stated that Mr. Greenwood - - I be-

lieve the former Attorney General of Wyoming - - lived only a few doors away. So he went to the 'phone and called Mr. Greenwood over; and upon Mr. Greenwood's arrival, Mr. Burritt asked him if there was any law in Wyming that would permit him to close Wyoming appropriators for the benefit of senior appropriators in Nebraska, and Mr. Greenwood said no, not that he knew of.

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Q. Did Mr. Cochran say anything further?

A. Mr. Cochran made reference to a conference that had been held in Washington some months prior, I believe in the Fall before, of '33, at which time Governor Miller, and I believe Senator O'Mahoney, and I think Mr. Wilkerson of Casper, were present, at which time he stated that Wyoming had promised, or that its officials had promised that if Nebraska would withdraw any objections that they might have to the Casper-Alcova project, that in the future they would see to it that the Wyoming officials would administer the streams so that Nebraska senior appropriators would be recognized.

Q. What further did Mr. Cochran say, - anything further about that understanding?

A. He said had Nebraska realized there would be a change in Wyoming's position, that the stand of Nebraska might have been different, and he said in his opinion it was a breach of faith on the part of Wyoming.

EXTRACT FROM TESTIMONY OF M. E. BALL GIVEN IN JULY, 1941, RECORD, PAGES 25966 TO 25968.

Q. Mr. Ball, with reference to your trips, did you ever inspect the outlet works of Big Creek Reservoir?

A. Yes, I have.

Q. That is the body of water which is also known as Big Creek Lake?

A. Yes.

Q. In what part of the North Park area is it located?

A. It is in the northwest portion of the Park.

Q. What relation does it have to the stream known as Big Creek?

A. It is near the headwaters of Big Creek. There are tributaries in the high mountains which contribute to the supply of Big Creek, but it is located very near the headwaters of Big Creek.

Q. Is there any storage space in addition to the natural water naturally contained in the natural lake?

A. Yes sir.

Q. Explain about that, will you, please?

A. At the outlet of the reservoir there is a Taintor gate which regulates the storage in the lake, and with

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the gate closed the water level in the lake can be raised.

Q. Is the bottom of the Taintor gate at the normal level, - or normal high-water level of the lake?

A. I assume that it is. It is my memory that it is of concrete construction, and that there would not be any possible way of drawing water out of the lake below the bottom of the outlet.

Q. At least, the normal water level, or high-water level, would have to be at least as high as the bottom of that Taintor gate?

A. As the bottom of the outlet, yes.

Q. What storage depth is made available by the existing artificial construction there?

A. I would like to refer to my diary on that.

Q. Can you state the date when you made the observation?

A. I made the observation on August 22, and I will just read from the diary.

THE MASTER: What year?

A. 1939. "August 22, 1939. To Big creek lake. Only natural flow coming out of Big creek lake. Taintor gate closed. Independence ditch diverting practically all flow of creek. Diversion by ditch 4.24 second feet in Parshall flume. Gauge height, 0.54. Storage depth in Big creek available for Independence ditch 2.95 feet, measured at the Taintor gate." I will continue to read: "Gate closed. Plus or minus 5 second feet flowing over the rim of lake west of

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gate. Natural flow."

Q. Does that 2.95 represent the amount by which the water level in the lake can be raised by closing the headgate, or the Taintor gate?

A. Yes sir. Water was flowing around the gate at the time we were at Big Creek Lake, when these measurements were made.

Q. That is, the gate was closed?

A. The gate was closed.

Q. Referring to Colorado Exhibit 37, can you give the approximate area of Big Creek Lake?

A. Big Creek Lake would appear from Colorado Exhibit 37 to have a surface area of about a half section, or, roughly, 320 acres.

Q. The height of approximately three feet that could be added by the closing of the Taintor gate would give how many acre-feet of water that could be stored and released?

A. Roughly, between 900 and 1000 acre-feet.

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EXTRACT FROM THE TESTIMONY OF RALPH I. MEEKER GIVEN JULY, 1941, RECORD, PAGES 26123 TO 26126.

Q. (By Mr. Good) Mr. Meeker, did you in any of your trips up to the North Park area inspect the outlet works of the Big Creek Reservoir?

A. I did.

Q. Would you state in general where the Big Creek Reservoir is located?

A. It is located on Big Creek a short distance above the Colorado line, in the northwest portion of the North Park, at the outlet of the Big Creek Lake.

Q. Just what is the relationship of the Big Creek Reservoir to Big Creek Lake?

A. It is a channel reservoir, an enlargement of the natural lake.

Q. And what is the reservoir; is it in the nature of an addition to the possible water that could be held back in Big Creek Lake?

A. Well, slightly so; but primarily a draw-down on the reservoir. There was an old crib structure, rock and crib structure, in the rim of the lake north of the present outlet works, showing that there had been a slight increase in the storage depth over natural conditions.

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Q. As I understand it, in the Big Horn Land & Cattle Company case versus the United States, which was brought out in connection with one of the earlier hearings when Colorado was producing testimony in connection with the Big Creek Lake, the storage is the amount above the natural level of the lake;

isn't that correct?

A. Well, I don't recall all of that data; I wouldn't undertake that.

Q. At any rate, the way the matter is constructed, or the way the works there are constructed, what amount of water is physically capable of being released? That is to say, only that which is above the lower level of the outlet works?

A. Yes. The floor of the outlet gate is 5 feet high, with a Taintor gate, and the rim of the lake is 2 feet lower than that, so that the storage depth is very close to 3 feet.

Q. Now, did you make an inspection of the outlet works and make a determination in connection with that?

A. Oh, yes.

Q. When did you inspect it?

A. On the 23rd of August, 1939.

Q. Would you state what you found in connection with the actual construction of the outlet works?

A. Well, there were 2.95 feet of controllable water in the lake, with about 5 second-feet overflowing through this low point in the rim where the old rock and log structure exists. The headgate was

Page 26125:

closed.

Q. And was all the water impounded that could be impounded at that time?

A. Yes.

Q. And what was the height of that water above the floor of the outlet gate?

A. As I just testified, 2.95 feet in depth.

Q. Would you describe the Taintor gate that is there for the control of the water?

A. Well, the outlet structure is new. It is of concrete, probably not over 3 or 4 years old, and the Taintor gate is a segment of a central - - or of a cylinder, controlled from an axle on the outside. The curved face of the gate is against the water, and the gate is raised from the outside and revolves on this axle - - steel axle.

Q. Can you state what is the area of the Big Creek Lake?

A. It is approximately 320 acres.

Q. And can you compute the approximate capacity of storage there under the conditions as you found them on August 23, 1939?

A. Well, 3 feet in depth times 320 acres is 960 acre-feet, so I would say, offhand, in a round figure, that the controllable water is approximately 1,000 acre-feet.

Q. Referring to page 17 of Colorado Exhibit 35, what is the decree amount and date for the Big Creek Reservoir?

A. 300,564,000 cubic feet. I will transpose that into acre-feet. Transposing into acre-feet gives 6,913

Page 26126:

acre-feet.

Q. What is the amount of the decreed capacity in excess of the present capacity?

A. 5,900 acre-feet.

Q. What relation does the Independence ditch have to the Big Creek Reservoir supply?

A. It is an outlet ditch from the Big Creek Reservoir that carries water around a mountainside and discharges it into Lake Creek, a tributary of the North Platte River; a transmountain ditch, for the reason

that Big Creek enters the North Platte River at a considerable distance below the Colorado-Wyoming line.

Q. And is that the only means by which Big Creek Lake reservoir water can be used in the State of Colorado, through the Independence ditch?

A. Well, it is the only means whereby it can be used in North Park.

Q. That is what I mean, in Colorado?

A. Yes.

Q. And the water is carried down Lake Creek for use on a ranch down there?

A. Yes.

Q. What ranch, do you recall?

A. Well, it is called Boettcher ranch, or otherwise the Big Horn Cattle Company, I believe.

Engineers' Stipulation, Pages 1-7

NORTH PLATTE RIVER BASIN

Items Agreed Upon by Engineers

R. I. Meeker	Nebraska
E. K. Nelson	Wyoming
C. L. Patterson	Colorado
J. A. Keimig	The United States

Engineers' Stipulation—May, 1942

DESCRIPTIVE

1. *Drainage Areas:*
   (a) Above Principal Stations (Colo., Wyo., Nebr.) — Colo. Exh. 70
   (b) Jackson County, Colorado (details) — Colo. Exh. 9
2. *General Topography:*
   (a) North Platte Basin in Colo., Wyo., and Nebr. — Colo. Exh. 71
   (b) Details Jackson County, Colorado — Colo. Exh. 6
3. *River Profile, Gradients and Distances:* Colo. Exh. 72

CLIMATIC CONDITIONS

General averages for period 1900-1938 adopted without prejudice to records at other stations and for other years.

4. *Annual Precipitation:*
   (a) General Averages per Map and Table — Colo. Exh. 80
   (b) Details—U. S. Weather Bureau Records
      (1) Jackson Co., Colo. Stations — Colo. Exh. 8
      (2) Stations in Wyoming — Colo. Exh. 73

(3) Stations in Western Nebr. Colo. Exh. 74
(4) Stations in Central Nebr. Colo. Exh. 75
(5) South Platte Stations (Colo., Wyo., Nebr.) Colo. Exh. 76

5. *Annual Temperatures:*
(a) General Averages per Map and Table Colo. Exh. 81
(b) Details—Stations Colo., Wyo. and Nebr. Colo. Exh. 77

6. *Evaporation Data:*
(a) Stations in Colo., Wyo. and Nebr. Colo. Exh. 78

Page 2 of Engineers' Stipulation.

7. *Frost Free Periods:*
(a) General Averages per Map and Table Colo. Exh. 83
(b) Details—Stations in Colo., Wyo. and Nebr. Colo. Exh. 82

8. *Seasonal Precipitation:*
(a) General Averages per Map and Table Colo. Exh. 85
(b) Summary—Stations in Colo., Wyo. and Nebr. Colo. Exh. 84

9. *Seasonal Temperatures:*
(a) General Averages per Map and Table Colo. Exh. 87
(b) Summary—Stations in Colo., Wyo. and Nebr. Colo. Exh. 86

STREAM FLOWS

Data agreed upon for water supply study without prejudice to records at other stations or for

other periods. Values for water-years October 1 to September 30. Maximum, Minimum and average values are for 37-year period, 1904-1940, unless otherwise noted. Monthly and Annual values per attached tabulations, one for each principal station.

10. *North Platte River at Northgate, Colorado:*
    (a) Maximum 714,000 A. F. 1909
    (b) Minimum 89,000 A. F. 1934
    (c) Average 377,000 A. F. 1904-1940
    (d) Monthly Values per Colo. Exh. 10 (1904-39); Nebr. Exh. 602 (1940)

11. *North Platte River at Saratoga, Wyoming:*
    (a) Maximum 1,828,000 A. F. 1909
    (b) Minimum 239,000 A. F. 1934
    (c) Average 927,000 A. F. 1904-1940
    (d) Monthly Values per Colo. Exh. 94 (1904-39); Nebr. Exh. 602 (1940)

12. *North Platte River at Pathfinder Reservoir:*
    (a) Maximum 2,399,000 A. F. 1917
    (b) Minimum 382,000 A. F. 1934
    (c) Average 1,316,000 A. F. 1904-1940
    (d) Monthly Values per Nebr. Exh. 6 for 1904-1935 with corrections, add 60,000 A. F. in April, 1919; and Wyo. Exh. 153 for 1936-1940.
    (e) Note: Includes evaporation loss at Seminoe Reservoir for 1939-1940.

Page 3 of Engineers' Stipulation.

13. *North Platte River below Pathfinder Reservoir:*
    (a) Maximum 2,231,000 A. F. 1909
    (b) Minimum 486,000 A. F. 1934

(c) Average 1,272,000 A. F. 1904-1940

(d) Monthly Values per Nebr. Exh. 6 (1904-1908); Nebr. Exh. 7 (1909-1935); Nebr. Exh. 300 (1936); and Nebr. Exh. 602 at Alcova (1937-1940).

(e) Pathfinder Reservoir operations commenced in 1909.

(f) Indicated average yearly evaporation loss for 1904-1940 of 44,000 A. F. (1,316,000 A. F. inflow minus 1,272,000 A. F. outflow) would be reduced to about 43,000 A. F. per year taking into account the carryover storage of 34,300 A. F. (all three reservoirs) as of September 30, 1940.

(g) The indicated average yearly evaporation losses are not representative of future average conditions. With Seminoe, Pathfinder and Alcova Reservoirs functioning, evaporation losses could average from 66,000 to 86,000 A. F. yearly, depending upon downstream releases.

14. *North Platte River at Guernsey Reservoir:*
(Reservoir Inflow)

(a) Maximum 2,575,000 A. F. 1917

(b) Minimum 597,000 A. F. 1934

(c) Average 1,561,000 A. F. 1904-1940

(d) Yearly Values per Wyoming Exh. 173, as modified by evaporation correction 4,000 A. F. per year, 1928-1939 inclusive.

(e) Unrecorded Values Items 14 and 15 for years 1904-1909 supplied by averaging estimates per Colo. Exh. 92 and Nebr. Exh. 8.

15. *North Platte River above Whalen:*

(a) Maximum 2,575,000 A. F. 1917

(b) Minimum 603,000 A. F. 1934
(c) Average 1,559,000 A. F. 1904-1940
(d) Monthly Values per Nebr. Exh. 8 (1910-1935); Nebr. Exh. 300 (1936); Nebr. Exh. 582 (1937); Nebr. Exh. 585 (1938); and Nebr. Exh. 602 (1939-1940).
(e) Unrecorded Values Items 14 and 15 for years 1904-1909 supplied by averaging estimates per Colo. Exh. 92 and Nebr. Exh. 8.
(f) Guernsey Reservoir operation commenced 1928.

16. *North Platte River at Wyoming-Nebraska Line:*
(a) Published Data per U. S. Exh. 117 for May, 1929, to end of 1938; and Nebr. Exh. 602 for 1939 and 1940.

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17. *North Platte River at Bridgeport, Nebraska:*
(1915-1940)

(a) Maximum 2,727,000 A. F. 1917
(b) Minimum 526,000 A. F. 1936
(c) Average 1,372,000 A. F. 1915-1940
(d) Monthly quantities recorded by U. S. Geological Survey to control (see Nebr. Exh. 14 and Colo. Exh. 91); unrecorded values are averages of monthly estimates per Colo. Exh. 91 and Nebr. Exh. 14. (See also U. S. Exh. 118 and Nebr. Exh. 602.)

18. *North Platte River at North Platte, Nebraska:*
(a) Period 1904-1940
(1) Maximum 3,481,000 A. F. 1917
(2) Minimum 710,000 A. F. 1911
(3) Average 1,857,000 A. F. 1904-1940

(b) Period 1915-1940

(1) Maximum	3,481,000	A. F.	1917
(2) Minimum	755,000	A. F.	1940
(3) Average	1,820,000	A. F.	1915-1940

(c) Values 1936-1940 include Sutherland Canal Diversions.

(d) Records of U. S. Geological Survey to govern (see Nebr. Exh. 18-19 and Colo. Exh. 90); unrecorded values are averages of monthly estimates from Nebr. Exh. 18-19 and Colo. Exh. 90.

19. *Other Stations on North Platte River:*

(a) Records for various periods at stations in Wyoming and Nebraska per Colo. Exh. 96; U. S. Exh. 105.

20. *Tributaries of North Platte River:*

(a) In Colorado: Colo. Exh. 11-25

(b) Big Creek and Encampment River Colo. Exh. 32-33

(c) Laramie River at Ft. Laramie Wyo. (1915-1940)

(1) Maximum	397,000	A. F.	1917
(2) Minimum	36,000	A. F.	1934
(3) Average	132,000	A. F.	1915-1940

(4) Monthly Values per U. S. Exh. 125 (1915-1938) and Nebr. Exh. 603 (1939-1940).

(5) Historical averages will decline in a similar future climatic cycle by reason of upstream reservoir construction during historical period.

(d) Misc. Tributaries in Wyoming and Nebraska

(1) Recorded Data per Colo. Exh. 97 to year 1938.

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21. *South Platte River at North Platte, Nebraska:*
    (a) Records (1914-1940) per Colo. Exh. 132 (1914-1939); Wyo. Exh. 168 (1940).

22. *Main Platte River in Nebraska:*
    Descriptive:
    (a) Drainage Areas and Distances per Colo. Exh. 131.
    (b) Stream Flow Records
        (1) Main River Stations—Colo. Exh. 133-145; Nebr. Exh. 602; U. S. Exh. 105.
        (2) Tributary Stations—Colo. Exh. 146-154.

23. *Trans-Mountain Diversions:*

(a) From Jackson County, Colorado	Colo. Exh. 43- 44
(b) From Laramie River	Colo. Exh. 120-126

RESERVOIRS

The following list of reservoirs and groups of reservoirs was compiled to aid in water supply and stream depletion studies contemplated by the engineers, but which were not undertaken or completed by them. The list does not purport to include all reservoirs, nor does the information concerning capacities, areas, dates of operation and related matters necessarily conform to the permitted or decreed items.

24. *Miscellaneous Reservoirs—Jackson County Colo.:*
    (a) Approximate aggregate capacities 12,000 A. F.

25. *Miscellaneous Reservoirs above Pathfinder in Wyo.:*
    (a) Aggregate Capacities (transcript, pages 27, 254)

Exclusive of reservoirs in Dutton Creek Basin 18,000 A. F.

26. *Seminoe Reservoir:* (on North Platte River)
(a) H. W. L.
Elev. 6,357 Ft. Capacity 1,026,000 A. F.
(b) Dead Storage
below Elev. 6,200 Ft. 2,000 A. F.

(c) Available 157 Ft. 1,024,000 A. F.
(d) Details of Areas and Capacities per Wyo. Exh. 169.
(e) Operation Commenced April, 1939 (Nebr. Exh. 602).

27. *Pathfinder Reservoir:* (on North Platte River)
(a) H. W. L.
Elev. 5,852 Ft. Capacity 1,045,000 A. F.
(b) Outlet
Elev. 5,700 Ft. 0 A. F.

(c) Available 152 Ft. 1,045,000 A. F.
(d) Details of areas and capacities per Wyo. Exh. 169.
(e) Operation commenced April, 1909 (Colo. Exh. 99).
(f) Storage Operations—graph, Colo. Exh. 100.
(g) Contents—Tables, Colo. Exh. 99; Nebr. Exh. 602.

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28. *Alcova Reservoir:* (on North Platte River)
(a) H. W. L.
Elev. 5,500 Ft. Capacity 190,000 A. F

(b) Sill-Casper Canal
Elev. 5,487 Ft. Capacity 160,000 A. F.
(c) Outlet Elevation
5,320 Ft. Capacity 0
(d) Details of areas and capacities, Wyo. Exh. 169.
(e) Operation commenced Feb., 1938 (Nebr. Exh. 602).

29. *La Prele Reservoir:* (on La Prele Creek)
(a) Capacity (Nebr. Exh. 31) 20,000 A. F.
(b) Operation commenced 1910 (transcript, page 18,656).

30. *Guernsey Reservoir:* (on North Platte River)
(a) H. W. L.
Elev. 4,420 Ft. Capacity 52,000 A. F.
(b) Outlet Sill
Elev. 4,370 Ft. Capacity 2,000 A. F.
(c) Available 50 Ft. Capacity 50,000 A. F.
(d) Power Outlet Sill
Elev. 4,360 Ft. 0
(e) Details areas and capacities—U. S. Exh. 242, 246.
(f) Storage Contents—Colo. Exh. 99.
(g) Operation commenced December, 1927.

31. *Reservoirs in Laramie River Basin in Wyoming:*
(a) Sodergreen Reservoir; capacity 1,000 A. F.; Wyo. Exh. 56 (transcript, page 18,555).
(b) Lake Hattie (Laramie River); capacity 68,500 A. F.; Wyo. Exh. 56; commenced 1912.
(c) Oasis Reservoir; capacity 781 A. F.; Wyo. Exh. 61.
(d) James Lake (Little Laramie); capacity 41,000 A. F.; Wyo. Exh. 61; commenced 1912.

(e) Wyo. Devel. Co. Res. No. 1 (Wheatland No. 1) Sybille Cr. and Laramie River; original capacity 5,360 A. F.; completed May, 1897; enlargement to total capacity 7,136 A. F.; begun about 1938 (trans., p. 19,102); was still incompleted but practically completed on Nov. 14, 1939 (trans. p. 18,990).

(f) Wyo. Devel. Co. Res. No. 2 (Wheatland No. 2) Laramie River; capacity 99,000 A. F.; completed 1901 (trans. p. 19,018); enlargement 91,000 A. F.; approximate date of completion 1942.

(g) North Laramie Project (North Laramie River)
(1) Reservoir No. 1—Capacity 1,970 A. F.
(2) Reservoir No. 2—Capacity 1,300 A. F.
(3) Reservoir No 3—Capacity 3,150 A. F.
(4) See Wyo. Exh. 79; completed 1912.

32. *Off-Channel Reservoirs—Pathfinder Irrigation District in Nebr.:*

Data from U. S. Exh. 132

(a) Alice Reservoir, capacity 12,000 A. F., completed 1912.

(b) Winters Cr. Res., capacity 2,000 A. F., completed 1912.

(c) Minatare Res., capacity 60,000 A. F., completed 1915.

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33. *Reservoirs in Horse Creek Basin in Wyo.:*

(a) Hawk Springs—Total Capacity 19,443 A. F., Wyo. Exh. 69; operation to 15,700 A. F. commenced 1921; enlarged 1925.

(b) Sinnard Res.—Capacity 1,540 A. F.; completed

1935, Wyo. Exh. 69.

(c) Misc. Res.—approximate capacity 10,000 A. F., Nebr. Exh. 91.

34. *Crescent Lake Reservoir on Blue Creek in Nebraska:*

(a) Capacity—filing for 7,000 A. F. dated Jan. 23, 1920.

35. *Kingsley Reservoir:* (on North Platte River)

(a) Capacity (as reported)	2,000,000 A. F.	
(b) Surface Area (H. W. L.)	32,000 acres	
(c) Operation commenced Feb., 1941.		
(d) References—U. S. Exh. 182; Nebr. Exh. 640 (trans., pp. 25,500 and 25,535).		

36. *Sutherland Reservoir:*

(Off-Channel; Sutherland Supply Canal)

(a) Capacity (constructed)	178,000 A. F.	U. S. Exh. 182
(b) Capacity—total	180,000 A. F.	
(c) Less unavailable	5,000 A. F.	
(d) Available	175,000 A. F.	(trans. p. 7,433)

(e) Operation commenced December, 1935 (trans., p. 7,443).

37. *Sutherland Regulating Reservoir:*

(a) Capacity—total	21,200 A. F.	(trans., p. 7,436)
(b) Less unavailable	5,400 A. F.	
(c) Available	15,800 A. F.	

(d) Operation commenced June, 1936 (trans., p. 7,443).

38. *Jeffrey Canyon Reservoir:*
    (a) Capacity—total 15,000 A. F. U. S. Exh. 182
    (b) Unavailable 3,600 A. F.
    (c) Available 11,400 A. F.
    (trans., p. 25,535)
    (d) Operation commenced year 1941.
39. *Johnson Canyon Reservoir:*
    (a) Capacity—total 55,000 A. F.
    (trans., p. 25,535)
    (b) Unavailable 5,500 A. F.
    (c) Available 49,500 A. F.
    (d) Operation commenced year 1941.
40. *Minor Reservoirs* on tributaries below Alcova Reservoir in Wyoming and Nebraska not itemized nor individually evaluated.

STATE OF NEBRASKA
BUREAU OF IRRIGATION
R. H. WILLIS, CHIEF

Sheet No. 25 Nebraska Exhibit 11
1931-32

DAILY DISCHARGE LARAMIE RIVER NEAR FORT LARAMIE, WYOMING

From Page 217, Water Supply Paper No. 731 U. S. Geological Survey
Values in Second-feet

R. I. Meeker, Consulting Engineer

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	110	110	128	130	160	131	280	94	43	14	15
2	43	110	108	130	128	160	131	280	73	43	14	16
3	45	110	108	130	128	150	146	155	73	43	14	15
4	39	115	110	145	130	90	581	203	63	54	14	16
5	39	116	110	122	128	84	650	327	63	38	14	16
6	40	104	110	120	138	86	480	380	54	73	14	16
7	40	98	110	115	138	84	459	370	45	36	14	16
8	45	97	110	128	140	74	427	380	36	36	14	16
9	52	103	110	130	165	74	326	334	30	44	14	15
10	69	109	110	132	180	96	265	290	30	45	13	15
11	69	109	110	135	195	114	240	290	25	45	13	16
12	71	109	108	130	145	105	221	279	23	44	13	17
13	82	109	86	106	150	146	176	260	20	26	13	17
14	77	109	90	84	130	148	144	355	24	24	17	17
15	71	103	115	100	130	170	144	218	24	24	13	16
16	63	103	115	120	130	175	157	224	15	22	13	16
17	58	103	120	128	150	160	172	219	15	20	13	16

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STATE OF NEBRASKA
BUREAU OF IRRIGATION
R. H. WILLIS, CHIEF

Sheet No. 25 Nebraska Exhibit 11—(Continued)
1931-32

DAILY DISCHARGE LARAMIE RIVER NEAR FORT LARAMIE, WYOMING

From Page 217, Water Supply Paper No. 731 U. S. Geological Survey

Values in Second-feet

R. I. Meeker, Consulting Engineer

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
18	83	103	115	128	145	160	184	183	17	20	13	16
19	74	103	135	130	150	160	186	160	95	20	13	16
20	78	103	140	142	160	185	174	140	74	15	12	17
21	95	83	140	145	180	185	154	140	65	15	12	16
22	95	72	140	130	190	185	133	165	53	15	13	17
23	89	68	135	135	195	185	139	147	39	15	13	17
24	94	88	150	132	200	185	158	130	36	15	13	17
25	95	86	145	135	155	185	198	94	35	15	13	20
26	95	97	160	135	155	185	150	84	37	15	13	21
27	101	98	175	140	140	185	198	74	36	15	13	22
28	95	98	130	125	150	160	235	74	39	15	13	22
29	120	98	140	110	150	160	209	76	61	15	15	25
30	125	110	110	110		160	197	105	54	14	15	27
31	114		110	110		135		130		14	14	

NOTE:—During the winter water is diverted 4 miles upstream for use of the Lingle power plant; discharge is corrected for this diversion. Flow regulated by Wheatland Reservoir having a capacity of 110,000 acre-feet. Complete records furnished by Bureau of Reclamation.

STATE OF NEBRASKA
BUREAU OF IRRIGATION
R. H. WILLIS, CHIEF

Sheet No. 27 Nebraska Exhibit 11
1934

DAILY DISCHARGE LARAMIE RIVER AT FORT LARAMIE, WYOMING

From U. S. Bureau of Reclamation Blue Print
Values in Second-feet

R. I. Meeker, Consulting Engineer

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	59	59	140	96	106	102	38	6	8	5	3
2	24	59	64	98	96	109	102	38	4	8	7	4
3	26	64	68	99	86	100	100	43	4	8	6	4
4	27	64	69	90	86	100	100	30	6	14	5	4
5	29	40	63	95	86	100	100	30	4	14	6	4
6	30	76	131	90	86	100	115	30	4	14	6	4
7	31	87	83	69	86	100	115	33	4	11	6	6
8	35	83	81	70	86	100	102	38	4	11	6	7
9	38	83	84	105	86	100	102	27	4	11	5	8
10	40	83	82	108	96	100	102	15	4	11	5	12
11	40	83	80	96	86	105	100	12	4	8	5	9
12	39	63	61	108	91	105	97	12	4	7	4	9
13	37	60	76	108	96	105	97	12	4	7	4	9
14	32	58	81	115	96	105	97	10	4	8	5	11
15	34	58	88	108	96	105	97	10	4	8	3	13
16	34	59	68	104	91	105	97	10	5	8	3	13
17	34	60	43	104	91	105	97	2	4	6	3	13

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STATE OF NEBRASKA
BUREAU OF IRRIGATION
R. H. WILLIS, CHIEF

Sheet No. 27 Nebraska Exhibit 11—(Continued)
1934

DAILY DISCHARGE LARAMIE RIVER AT FORT LARAMIE, WYOMING

From U. S. Bureau of Reclamation Blue Print
Values in Second-feet

R. I. Meeker, Consulting Engineer

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
18	37	60	58	106	79	105	68	6	22	6	3	12
19	40	60	111	106	79	105	64	6	14	8	3	12
20	43	61	96	104	79	105	60	6	13	6	3	13
21	55	61	91	104	79	105	55	6	10	5	3	16
22	74	79	91	104	76	105	54	8	10	6	3	16
23	79	86	86	104	83	105	50	6	9	7	3	15
24	86	58	86	114	53	102	45	6	8	7	3	15
25	72	50	83	114	43	102	40	6	10	6	3	15
26	70	44	43	104	47	102	40	6	9	6	3	13
27	70	46	73	116	88	102	40	6	10	7	3	2
28	70	43	103	116	110	102	50	6	9	14	3	2
29	58	43	93	106		102	38	6	9	10	3	2
30	53	51	116	106		102	38	6	9	7	3	2
31	58		100	106		102		6		6	3	

NOTE:—During the winter water is diverted 4 miles upstream for use of the Lingle power plant; discharge is corrected for this diversion.

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May Evaporation Charge,
Pathfinder Dam to Guernsey Dam,
140 Second-Feet.

MAY 1934

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

Sheet 2, Nebraska Exhibit 226.

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain Path. D.-Guern. D.	
MONTH	DIRECT FLOW				STORED WATER													
	Total Outflow Nebr. Ex.	Gross Neb. Ex. (a)	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	1020	1110	140	880	0	0	0	4	666	0	666	852		186	186	666	354	
2	1400	1300	130	1170	100	10	90	5	891	90	801	513	378		0	513	509	
3	1840	1010	77	933	830	63	767	6	1533	767	766	470	1063		0	470	307	
4	2390	1160	68	1092	1230	72	1158	7	1912	1158	754	330	1582		0	330	478	
5	1620	1210	105	1105	410	35	375	8	1733	375	1356	387	1346		0	387		113
6	1470	1500	140	1330	0		0	9	1386	0	1386	398	b 988		0	398	84	
7	1480	1600	140	1340	0		0	10	1325	0	1325	352	973		0	352	155	
8	1480	1510	140	1340	0		0	11	1305	0	1305	352	953		0	352	175	
9	1480	1670	140	1340	0		0	12	1303	0	1303	381	922		0	381	177	
10	1480	1630	140	1340	0		0	13	1247	0	1247	330	917		0	330	233	
11	1480	1820	140	1340	0		0	14	1275	0	1275	307	968		0	307	205	
12	1480	1590	140	1340	0		0	15	1293	0	1293	335	958		0	335	187	
13	1480	1730	140	1340	0		0	16	1282	0	1282	410	872		0	410	198	
14	1480	1910	140	1340	0		0	17	1351	0	1351	676	675		0	676	129	
15	1000	2070	140	860	0		0	18	1148	0	1148	1103	45		0	1103		148
16	950	1940	140	810	0		0	19	963	0	963	1799		836	836	963		13
17	950	1700	140	810	0		0	20	901	0	901	2080		1179	1179	901	49	
18	1470	1530	140	1330	0		0	21	1118	0	1118	2338		1220	1220	1118	352	
19	1950	1470	106	1364	480	34	446	22	1502	446	1056	2878		1376	1822	1056	448	
20	2360	1380	82	1298	980	58	922	23	1948	922	1026	3087		1139	2061	1026	412	
21	2930	1670	51	1019	1860	89	1771	24	2501	1771	730	3564		1063	2834	730	429	
22	3410	1230	50	1180	2180	90	2090	25	3022	2090	932	4090		1068	3158	932	388	
23	3940	1200	43	1157	2740	97	2643	26	3441	2643	798	4550		1109	3752	798	499	
24	4310	1270	39	1161	3110	101	3009	27	4308	3009	1299	4686		378	3387	1299	2	
25	4750	1040	31	1009	3710	109	3601	28	4235	3601	634	5047		812	4413	634	515	
26	4760	1090	32	1058	3670	108	3562	29	4338	3562	776	5094		756	4318	776	422	
27	4730	1010	30	980	3720	110	3610	30	4529	3610	919	5214		685	4295	919	201	
28	5030	850	24	826	4180	116	4064	31	4860	4064	796	5238		378	4442	796	170	
29	5310	970	26	944	4340	114	4226	1	4969	4226	743	5166		197	4423	743	341	
30	5460	1120	29	1091	4340	111	4229	2	5087	4229	858	5047	40		4189	858	373	
31	5490	640	17	623	4790	123	4667	3	5209	4667	542	4906	303		4364	542	221	
Totals	80320	43280	2900	34750	42670	1440	41230		72581	41230	31349	71980	12983	12196	50879	21101	8013	274
Acre-feet	160640	84520	5800	69500	85340	2880	82460		145162	82460	62698	143960	25966	24392	101758	42202	16026	548

(a) May 1 and May 6 to 18, inclusive, storage in Pathfinder Reservoir. Use values in Col. 2 for Col. 3.

(b) During the period of May 5-18, 20,500 acre-feet of direct flow were stored in Guernsey Reservoir, and 4780 acre-feet of Pathfinder Reservoir water were restored at Guernsey.

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Sheet 3, Nebraska Exhibit 226.

River Channel Evaporation Charge,
Pathfinder Dam to Guernsey Dam;
[illegible] Second-Feet.

JUNE 1934

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain Path. D.-Guern. D.	
MONTH	DIRECT FLOW				STORED WATER													
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	5660	620	21	599	5040	175	4865	4	6302	4865	1437	3348	2954		1911	1437		642
2	5570	830	29	801	4740	167	4573	5	5283	4573	710	2798	2485		2088	710	287	
3	5530	1050	37	1013	4480	159	4321	6	5012	4321	691	3384	1628		2693	691	518	
4	5470	940	34	906	4530	162	4368	7	3501	4368	* 0	3420	81		b 3429	0	1969	
5	1600	850	104	746	750	92	658	8	2063	658	* 538	3384		1321	1979	1405		463
6	1520	820	106	714	700	90	610	9	1869	610	1259	3310		1441	2051	1259		349
7	2390	930	76	854	1460	120	1340	10	2318	1340	978	2525		207	1547	978	72	
8	2510	510	40	470	2000	156	1844	11	2280	1844	436	2093	187		1657	436	230	
9	1630	470	57	413	1160	139	1021	12	1768	1021	747	2040		272	1293	747		138
10	960	540	110	430	420	86	334	13	1358	334	1024	1595		237	571	1024		298
11	830	480	113	367	350	83	267	14	1095	267	828	1060	35		232	828		265
12	830	470	111	359	360	85	275	15	1072	275	797	931	141		134	797		242
13	830	390	92	298	440	104	336	16	1236	336	900	939	297		39	900		406
14	830	340	80	260	490	116	374	17	1024	374	650	923	101		273	650		194
15	830	290	68	222	540	128	412	18	1084	412	672	675	409		3	672		254
16	830	300	71	229	530	125	405	19	989	405	584	596	393		12	584		159
17	830	320	76	244	510	120	390	20	960	390	570	577	383		7	570		130
18	830	290	68	222	540	128	412	21	928	412	516	570	358		54	516		98
19	830	390	92	298	440	104	336	22	920	336	584	577	343	a- 7	0	577		90
20	830	450	106	344	380	90	290	23	907	290	617	564	343	a- 53	0	564		77
21	830	290	68	222	540	128	412	24	866	412	454	488	378		34	454		36
22	830	260	62	198	570	134	436	25	834	436	398	410	424		12	398		4
23	830	210	50	160	620	146	474	26	855	474	381	386	469		5	381		25
24	600	220	72	148	380	124	256	27	813	256	557	375	438	a-182	0	375		213
25	530	230	85	145	300	111	189	28	657	189	468	375	282	a- 93	0	375		127
26	520	190	72	118	330	124	206	29	615	206	410	369	247	a- 41	0	369		96
27	520	160	60	100	360	136	224	30	551	224	327	369	182		42	327		31
28	520	170	64	106	350	132	218	1	544	218	326	393	151		67	326		24
29	510	210	81	129	300	115	185	2	563	185	378	301	262	a- 77	0	301		53
30	510	160	61	99	350	135	215	3	524	215	309	352	172		43	309		14
31																		
Totals	47340	13380	2166	11214	38960	3714	30246		48792	30246	18546	39127	13143	3478	453	20167	18960	2676	4528
Acre-feet	94680	26760	4332	22428	67920	7428	60492		97584	60492	27092	78254	26286	6956	906	40334	37920	5352	9056

* 867 carried over from 7th.

(a) Direct flow stored at Guernsey Reservoir.

(b) 4287 — 867 = 3420.

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July Evaporation Charge,
Pathfinder Dam to Guernsey Dam,
215 Second-Feet.

JULY 1934
NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM
SEGREGATION DIRECT FLOW AND STORED WATER
Corrected For River Channel Evaporation Losses
R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer
VALUES IN SECOND-FEET

Sheet 4, Nebraska Exhibit 226.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW																River Loss or Gain	
MONTH		DIRECT FLOW			STORED WATER			GUERNSEY RESERVOIR INFLOW					GUERNSEY RESERVOIR OUTFLOW				Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	510	130	55	75	380	160	220	4	521	220	301	446	75		145	301		11
2	510	170	72	98	340	143	197	5	606	197	409	495	111		86	409		96
3	510	150	63	87	360	152	208	6	508	208	300	609		101	309	300	2	
4	510	140	59	81	370	156	214	7	490	214	276	616		126	340	276	20	
5	500	170	73	97	330	142	188	8	524	188	336	1300		776	964	336		24
6	500	640	215	285	0	0	0	9	519	0	519	2268		1749	1749	519		19
7	500	340	146	194	160	69	91	10	508	91	417	2540		2032	2123	417		8
8	1340	240	39	a 201	1100	176	924	11	438	aa 438	0	2495		2057	2495	0	902	
9	2540	180	15	165	2360	200	2160	12	1561	1561	0	2735		1174	2735	0	979	
10	2540	130	11	119	2410	204	2206	13	1972	1972	0	2990		1018	2990	0	568	
11	2510	100	9	91	2410	206	2204	14	2070	2070	0	2942		872	2942	0	440	
12	2510	180	15	165	2330	200	2130	15	2001	2001	0	2878		877	2878	0	509	
13	2970	60	4	56	2910	211	2699	16	2544	2544	0	2660		116	2660	0	426	
14	2980	90	6	84	2890	209	2681	17	2558	2558	0	2004	554		2004	0	422	
15	2550	90	8	82	2460	207	2253	18	2229	2229	0	1669	560		1669	0	321	
16	2470	90	8	82	2380	207	2173	19	2169	2169	0	1035	1134		1035	0	301	
17	2590	100	8	a 92	2490	207	2283	20	2271	aa 2271	0	1011	1260		1011	0	319	
18	1090	90	18	72	1000	197	803	21	1385	803	582	1395		10	813	582		295
19	990	30	6	24	960	209	751	22	1092	751	341	1405		313	1064	341		102
20	990	30	6	24	960	209	751	23	894	751	143	1766		872	1623	143	96	
21	1930	40	5	b 35	1890	210	1680	24	1295	bb 1295	0	1920		625	1920	0	635	
22	2380	40	4	b 36	2340	211	2129	25	1932	bb 1932	0	1932	0	0	1932	0	448	
23	2510	80	7	73	2430	208	2222	26	2321	2222	99	1711	610		1612	99	189	
24	2480	110	9	101	2370	206	2164	27	3657	2164	1493	1832	1825		339	1493		1177
25	890	60	14	46	830	201	629	28	1799	629	1170	2480		681	1310	1170		909
26	1360	160	25	135	1200	190	1010	29	1283	1010	273	1711		428	1438	273	77	
27	2490	550	48	502	1940	167	1773	30	2346	1773	573	1605	741		1032	573	144	
28	2500	140	12	128	2360	203	2157	31	2238	2157	81	1744	494		1663	81	262	
29	2570	240	20	220	2330	195	2135	1	2250	2135	115	2144	106		2029	115	320	
30	2510	190	16	c 174	2320	199	2121	2	2117	cc 2117	0	2510		393	2510	0	393	
31	2520	50	4	c 46	2470	211	2259	3	2176	cc 2176	0	2766		590	2766	0	344	
Totals	55730	4810	*000	3670	51080	5665	45415		50274	42846	7428	57614	7470	14810	50186	7428	8117	2641
Acre-feet	111460	9620	2000	7340	102160	11330	90830		100548	85692	14856	115228	14940	29620	100372	14856	16234	5282

*140 Sec.-Ft. Storage.

(a) Direct flow loss of 2274 A.-Ft. July 8-17. See Col. 12. Due to reservoir run of 2000 sec.-ft. and "out-of-priority diversions."
(b) Direct flow loss of 142 A.-Ft. July 21-22.
(c) Direct flow loss of 440 A.-Ft. July 30-31.

(aa) Reservoir water loss of 3800 A.-Ft. July 11-20, due to channel storage from reservoir run and "out-of-priority diversions."
(bb) Reservoir water loss of 1164 A.-Ft. July 24-25.
(cc) Reservoir water loss of 174 A.-Ft. Aug. 2-3.

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August Evaporation Charge, Pathfinder Dam to Guernsey Dam, 187 Second-Feet.

AUGUST 1934

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

Sheet 5, Nebraska Exhibit 226.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain	
MONTH	DIRECT FLOW				STORED WATER												Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Reh Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	2900	30	2	28	2870	185	2685	4	2574	2574	0	2942		368	2942	0	326	
2	3000	50	3	47	2950	184	2766	5	2644	2644	0	3138		494	3138	0	356	
3	2980	20	1	19	2960	186	2774	6	2711	a 2711	a 0	3054		343	3054	0	269	
4	2950	15	1	14	2935	186	2749	7	2864	2749	115	2990		126	2875	115	86	
5	3200	15	1	14	3185	186	2999	8	2989	2989	0	3070		81	3070	0	211	
6	3070	300	18	282	2770	169	2601	9	2738	2601	137	3040		302	2903	137	332	
7	2300	320	21	299	2480	166	2314	10	2556	2314	242	3070		514	2828	242	244	
8	2510	240	18	222	2270	169	2101	11	2420	2101	319	2894		474	2575	319	90	
9	2240	170	14	156	2070	173	1897	12	2119	1897	222	2366		247	2144	222	121	
10	2020	60	6	54	1960	181	1779	13	1930	1779	151	1920	10		1769	151	90	
11	1810	160	16	144	1650	171	1479	14	1723	1479	244	1920		197	1676	244	87	
12	1600	180	21	159	1420	166	1254	15	1573	1254	319	1956		383	1637	319	27	
13	1340	100	14	86	1240	173	1067	16	1451	1067	384	1174	277		790	384		111
14	1050	10	2	8	1040	185	855	17	1401	855	546	786	615		240	546		351
15	880	5	1	49	875	186	689	18	1216	689	527	470	b 746		0	470		336
16	820	35	8	27	785	179	606	19	947	606	341	352	595		11	341		127
17	790	150	36	114	640	151	489	20	874	489	385	758	116		373	385		84
18	750	85	21	64	665	166	499	21	848	499	349	1347		499	998	349		98
19	4420	160	71	89	260	116	144	22	784	144	640	1525		741	885	640		364
20	360	200	104	96	160	83	77	23	658	77	581	1515		857	934	581		298
21	360	170	88	82	190	99	91	24	522	91	431	1495		973	1064	431		162
22	340	90	49	41	250	138	112	25	401	112	289	1505		1104	1216	289		61
23	330	90	51	39	240	136	104	26	411	104	307	1495		1084	1188	307		81
24	320	95	56	39	225	131	94	27	431	94	337	1455		1024	1118	337		111
25	130	140	130	0	0	0	0	28	436	0	436	1328		892	892	436		306
26	80	120	80	0	0	0	0	29	449	0	449	852		403	403	449		369
27	110	110	110	0	0	0	0	30	443	0	443	302	c 141		0	302		333
28	110	105	105	0	5	5	0	31	337	0	337	226	d 111		0	226		227
29	110	110	110	0	0	0	0	1	290	0	290	335		45	45	290		180
30	110	70	70	0	40	40	0	2	262	0	262	247	e 15		0	247		152
31	105	80	80	0	25	25	0	3	297	0	297	307		10	10	297		192
Totals	39595	3485	1308	2172	36160	3935	32225		31299	31919	9380	49834	2626	11161	40778	9056	2239	3943
Acre-feet	79190	6970	2616	2344	72320	7870	64450		82598	63838	18760	99668	5252	22322	81556	18112	4478	7886

(a) Aug. 4 Loss Reservoir Water S. F. 111
5 Loss Reservoir Water 122
6 Loss Reservoir Water 63
8 Loss Reservoir Water 10
306
612 A. F.

(b) 57 Sec.-Ft. direct flow stored.
(c) 141 Sec.-Ft. direct flow stored.
(d) 111 Sec.-Ft. direct flow stored.
(e) 15 Sec.-Ft. direct flow stored.

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September Evaporation Charge, Pathfinder Dam to Guernsey Dam, 139 Second-Feet.

SEPTEMBER 1934

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

Sheet 6, Nebraska Exhibit 226.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
PATHFINDER RESERVOIR OUTFLOW																	River Loss or Gain	
MONTH	DIRECT FLOW				STORED WATER				GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	80	80			0		0	4	313	0	313	313	0	0	0	313		233
2	83	96			0		0	5	277	0	277	307		30	30	277		194
3	83	111			0		0	6	286	0	286	291		5	5	286		203
4	84	91			0		0	7	265	0	265	280		15	15	265		181
5	83	84			0		0	8	269	0	269	274		5	5	269		186
6	83	80			3	3	0	9	261	0	261	266		5	5	261		178
7	83	80			3	3	0	10	257	0	257	237	20		0	237		174
8	83	78			5	5	0	11	289	0	289	264	25		0	264		206
9	83	79			4	4	0	12	278	0	278	318		40	40	278		195
10	83	103			0		0	13	482	0	482	341	141		0	341		399
11	83	89			0		0	14	386	0	386	381	5		0	381		303
12	83	85			0		0	15	299	0	299	375		76	76	299		216
13	83	96			0		0	16	267	0	267	247	20		0	247		184
14	83	114			0		0	17	229	0	229	324		95	95	229		146
15	83	93			0		0	18	230	0	230	280		50	50	230		147
16	83	105			0		0	19	207	0	207	237		30	30	207		124
17	83	98			0		0	20	198	0	198	258		60	60	198		115
18	83	98			0		0	21	195	0	195	165	30		0	165		112
19	83	88			0		0	22	196	0	196	131	65		0	131		113
20	83	83			0		0	23	190	0	190	190	0	0	0	190		107
21	83	83			0		0	24	205	0	205	190	15		0	190		122
22	83	93			0		0	25	170	0	170	160	10		0	160		87
23	83	73			10	10	0	26	205	0	205	165	40		0	165		122
24	83	108			0		0	27	210	0	210	160	50		0	160		127
25	83	93			0		0	28	200	0	200	170	30		0	170		117
26	83	149			0		0	29	226	0	226	175	51		0	175		143
27	83	123			0		0	30	220	0	220	140	80		0	140		137
28	83	133			0		0	1	205	0	205	150	55		0	150		122
29	83	113			0		0	2	203	0	203	410		207	207	203		120
30	83	124			0		0	3	211	0	211	584		373	373	211		128
31																		
Totals	2488	2918			25	25	0		7429		7429	7783	637	991	991	6792		4941
Acre-feet	4976	5836			50	50	0		14858		14858	15566	(a)1274	1982	1982	13584		9882

(a) 1274 A.-Ft. direct flow stored in Guernsey Reservoir.

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APPENDIX

WYOMING ANSWER BRIEF

NEBRASKA EXHIBIT NO. 577
THE STATE OF WYOMING

Certificate of Appropriation of Water

Certificate Record No. 55, Page 318
Proof Number 21826, Page 1
Farm Unit Number 187

WHEREAS, CHARLES A. TOLLE, has presented to the Board of Control of the State of Wyoming proof of the appropriation of water from the North Platte River through the Interstate and Tristate Canals under Permit Number 1398 Enl., the Pathfinder Reservoir under Permit Number 609 Res., the Guernsey Reservoir under Permit Number 3905 Res., and Secondary Permit Number 4969 Enl., and the applications therefor including the General Statement filed therewith and made a part thereof, for the irrigation of the lands herein described, lying and being in MORRILL COUNTY, NEBRASKA.

NOW KNOW YE: That the Board of Control, under the provisions of Chapter 122, Wyoming Revised Statutes 1931 Sections 418 and 1501, by an order duly made and entered on the 15th day of November, 1937, in Order Record No. 8, Page 159, has determined and established the priority and amount of such Appropriation as follows:

NAME OF APPROPRIATOR, CHARLES A. TOLLE: POST OFFICE ADDRESS: LODGEPOLE, NEBRASKA.

AMOUNT OF APPROPRIATION: (a) One (1) cubic foot per second of time for each seventy (70) acres of irrigable land, said appropriation to be supplied by re-application of water from the Interstate Canal which is picked up by the Tristate Canal, and (b) Supplemental storage supply from the Pathfinder Reservoir and the Guernsey Reservoir; or any combination of the said sources of supply;

DATE OF APPROPRIATION: Natural flow re-application of water of the North Platte River, December 6, 1904; Right of storage in Pathfinder Reservoir, December 6, 1904; Right of storage in Guernsey Reservoir, April 20, 1923;

DESCRIPTION OF LAND TO BE IRRIGATED AND FOR WHICH THIS APPROPRIATION IS DETERMINED AND ESTABLISHED:

26.5 A. Lot 2,
36.6 A. SW¼ NE¼, Sec. 5, T. 19 N. R. 49 W.

TOTAL ACREAGE: Sixty three and one tenth (63.1) acres

The right to the use of water hereby confirmed and established is limited to irrigation and domestic use, and is subject to all the terms, conditions, and limitations of the Constitution and laws of the State of Wyoming governing the appropriation of water and applicable contracts with the United States of America made pursuant to the Act of Congress of June 17, 1902 (32 Stat., 388), as amended and supplemented, known as the Federal Reclamation Law.

IN TESTIMONY HEREOF, I, JOHN D. QUINN, President of the State Board of Control, have hereunto set my hand this 26th day of March, 1938, and caused the seal of said Board to be hereunto affixed.

John D. Quinn,
President.

Attest: Fulton R. Bellamy,
Ex-Officio Secretary.

(SEAL)

TESTIMONY OF E. O. DAGGETT, CONCERNING PREFERRED RIGHT ACREAGE UNDER TRI-STATE CANAL

(Pages 10670-71)

Q.—Now, which column on page 24 indicates the land on which toll has been charged?

A.—Well, these lands include the preferred rights.

Q.—Well, I know—oh, they do include the preferred rights?

A.—Yes, sir, with the toll charge.

Q.—But there is one of those columns which includes the land upon which toll has been charged, is there not?

A.—With the preferred rights.

Q.—What?

A.—The preferred rights and the toll charge.

Q.—Now, what column is that?

A.—Under 'Water delivery acreage, High Value.'

Q.—That is the first column after the column designating the years, isn't it?

A.—Yes sir.

(Page 10532)

Q.—Does this tabulation on page 24 include also the lands outside the District such as the preferred rights?

A.—It does include the preferred rights.

Q.—Does it include the 660 lands also?

A.—Yes sir.

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STATE OF NEBRASKA
BUREAU OF IRRIGATION
R. H. WILLIS, CHIEF

Sheet 2 of Nebraska Exhibit 302
1936

DAILY DISCHARGE LARAMIE RIVER NEAR FORT LARAMIE, WYOMING

From Unpublished Records U. S. Geological Survey in Cooperation with Bureau of Reclamation
Values in Second-feet

R. I. Meeker, Consulting Engineer

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	8	8	8	9	31	4	78	20	16	12	13
2	15	8	8	9	12	26	6	87	21	16	12	13
3	13	8	8	5	10	20	7	82	21	16	14	15
4	13	8	8	6	10	19	23	69	21	16	14	91
5	14	8	8	6	10	17	95	58	120	16	13	44
6	15	8	8	5	11	16	98	68	1380	16	13	37
7	14	8	9	4	12	16	102	130	630	16	13	32
8	13	8	12	4	12	15	111	125	372	16	12	29
9	13	8	10	6	11	13	120	122	300	15	12	24
10	13	8	8	6	10	13	120	115	279	15	12	26
11	12	8	8	6	8	13	109	115	205	15	12	26
12	10	8	8	7	8	10	159	118	165	14	12	25
13	9	8	8	8	8	9	400	100	138	44	12	23
14	9	9	8	6	8	8	360	93	104	31	12	20
15	9	9	8	5	8	8	244	82	93	32	12	19
16	7	8	8	5	8	8	196	78	91	28	12	20

STATE OF NEBRASKA
BUREAU OF IRRIGATION
R. H. WILLIS, CHIEF

Sheet 2 of Nebraska Exhibit 302—(Continued)
1936

DAILY DISCHARGE LARAMIE RIVER NEAR FORT LARAMIE, WYOMING

From Unpublished Records U. S. Geological Survey in Cooperation with Bureau of Reclamation
Values in Second-feet

R. I. Meeker, Consulting Engineer

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
17	7	8	8	4	8	7	173	71	74	19	12	20
18	7	8	8	6	8	6	135	64	60	16	12	19
19	7	8	8	8	8	6	120	53	52	13	13	17
20	6	7	8	9	8	6	109	43	41	13	13	17
21	6	8	8	8	10	6	102	35	35	13	14	16
22	7	8	8	8	19	5	98	32	32	13	15	16
23	6	8	8	8	35	5	89	28	28	12	15	16
24	6	8	8	8	58	5	87	26	26	12	14	19
25	6	8	8	8	71	5	82	26	24	12	14	16
26	6	8	8	9	65	4	91	25	24	12	14	17
27	6	8	8	8	53	4	98	23	23	12	14	18
28	7	8	8	8	41	4	89	23	21	12	14	21
29	7	8	8	8	35	4	78	23	19	12	14	20
30	7	8	8	8		4	78	21	17	12	14	20
31	7		8	8		4		21		13	14	

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(Page 137)

Evaporation Charge,
Pathfinder Dam to Guernsey Dam,
Second-Feet.

MAY 1936

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

Sheet 2, Nebraska Exhibit 306.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain	
	DIRECT FLOW				STORED WATER												Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Neb. Ex. (b)	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	1445	5272	140	1305	0	0	0	4	1723	0	1723	1194	(a) 529		0	1194		278
2	1030	4959	140	890	0	0	0	5	1572	0	1572	1370	(a) 202		0	1370		542
3	534	4672	140	394	0	0	0	6	1151	0	1151	1817		666	666	1151		617
4	536	4341	140	396	0	0	0	7	1022	0	1022	2352		1330	1330	1022		486
5	538	4486	140	398	0	0	0	8	1040	0	1040	2860		1820	1820	1040		502
6	1056	4829	140	916	0	0	0	9	1098	0	1098	3206		2108	2108	1098		42
7	2062	5456	140	1922	0	0	0	10	1919	0	1919	3240		1321	1321	1919	143	
8	2843	6181	140	2703	0	0	0	11	2685	0	2685	3366		681	681	2685	158	
9	3018	5639	140	2878	0	0	0	12	3017	0	3017	3657		640	640	3017	1	
10	3018	4944	140	2878	0	0	0	13	2801	0	2801	3910		1109	1109	2801	217	
11	3018	4198	140	2878	0	0	0	14	2912	0	2912	3950		1038	1038	2912	106	
12	3030	3675	140	2890	0	0	0	15	3141	0	3141	4316		1175	1175	3141		111
13	3917	3681	132	3549	236	8	228	16	3976	228	3748	4470		494	722	3748		50
14	4331	4044	131	3913	287	9	278	17	3081	278	2803	4422		1341	1619	2803	1250	
15	1264	4618	140	1124	0	0	0	18	1528	0	1528	4664		3136	3136	1528		264
16	4075	5232	140	3935	0	0	0	19	4163	0	4163	4909		746	746	4163		88
17	5231	5797	140	5091	0	0	0	20	4900	0	4900	5142		242	242	4900	331	
18	5452	6567	140	5312	0	0	0	21	5242	0	5242	5262		20	20	5242	210	
19	5808	7276	140	5668	0	0	0	22	5495	0	5495	5430	(a) 65		0	5430	313	
20	5966	7231	140	5826	0	0	0	23	5653	0	5653	5502	151		0	5502	313	
21	6014	6942	140	5874	0	0	0	24	5725	0	5725	5478	247		0	5478	289	
22	6030	6926	140	5890	0	0	0	25	5798	0	5798	5430	368		0	5430	232	
23	6054	6832	140	5914	0	0	0	26	5831	0	5831	5382	449		0	5382	223	
24	6062	6250	140	5922	0	0	0	27	5802	0	5802	5358	444		0	5358	260	
25	6062	6429	140	5922	0	0	0	28	5503	0	5503	5382	121		0	5382	559	
26	5540	6957	140	5400	0	0	0	29	5765	0	5765	5286	479		0	5286		225
27	6062	6178	140	5922	0	0	0	30	5865	0	5865	5094	771		0	5094	197	
28	6062	6557	140	5922	0	0	0	31	5862	0	5862	4909	953		0	4909	200	
29	6062	6685	140	5922	0	0	0	1	5859	0	5859	4932	927		0	4932	208	
30	6070	6992	140	5930	0	0	0	2	5596	0	5596	4840	756		0	4840	474	
31	5524	7070	140	5384	0	0	0	3	5382	0	5382	4510	(a) 872		0	4510	142	
	125714	176006	4522	118968	523	17	506		121107	506	120601	121640	7334	17867	18373	113267	5821	3214
	247433	353012	8645	237736	1046	34	1012		242214	1012	241202	263280	14868	35734	36746	226534	11642	6428

...ter discharge reduced to 0 flow for 12 hours account ...
...at Alcova Dam and Casper.
...ter inflow except May 13 and 14.

(a) Column 14, direct flow stored in Guernsey Reservoir 14,868 acre-feet.

Tightly Bound

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(Page 138)

River Channel Evaporation Charge,
Pathfinder Dam to Gnernsey Dam,
136 Second-Feet,

JUNE 1936

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

Sheet 3, Nebraska Exhibit 306.

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW																River Loss or Gain	
MONTH	DIRECT FLOW				STORED WATER				GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Neb. Ex. (b)	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	J Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	5470	7451	196	5274	0		0	4	5354	0	5354	4422	(a) 932		0	4422	116	
2	5477	7590	196	5281	0		0	5	4782	0	4782	3890	892		0	3890	695	
3	2702	8093	196	2506	0		0	6	3885	0	3885	2226	1659		0	2226		1183
4	1607	7280	196	1411	0		0	7	3591	0	3591	1574	2017		0	1574		1984
5	4816	6939	196	4620	0		0	8	3897	0	3897	1422	2475		0	1422	919	
6	2393	6568	196	2197	0		0	9	2476	0	2476	1695	781		0	1695		83
7	1962	7021	196	1766	0		0	10	2192	0	2192	1194	998		0	1194		230
8	1481	5804	196	1285	0		0	11	1882	0	1882	1085	797		0	1085		401
9	908	5073	196	712	0		0	12	1328	0	1328	1061	267		0	1061		420
10	598	4665	196	402	0		0	13	1174	0	1174	1053	(a) 121		0	1053		676
11	462	4446	196	266	0		0	14	889	0	889	1045		156	156	889		427
12	462	4169	196	266	0	0	0	15	799	0	799	1061		262	262	799		337
13	464	4167	196	268	0		0	16	674	0	674	1783		1109	1109	674		210
14	466	3945	196	270	0		0	17	806	0	806	2974		2168	2168	806		340
15	466	4053	196	270	0		0	18	825	0	825	3366		2541	2541	825		359
16	466	3970	196	270	0		0	19	847	0	847	3600		2753	2753	847		381
17	1961	3899	196	1765	0		0	20	995	0	995	4050		3055	3055	995	966	
18	2941	3898	196	2745	0		0	21	2473	0	2473	4232		1759	1759	2473	468	
19	3679	3691	196	3483	0		0	22	3413	0	3413	4466		1053	1053	3413	266	
20	4040	3661	178	3483	379	18	361	23	3842	361	3481	4664		822	1183	3481	198	
21	4815	3073	125	2948	1742	71	1671	24	4424	1671	2753	4978		554	2225	2753	391	
22	5091	2697	104	2593	2394	92	2302	25	4802	2302	2500	5190		388	2690	2500	289	
23	5287	2700	101	2599	2567	95	2472	26	5044	2472	2572	5286		242	2714	2572	223	
24	5637	2695	94	2601	2942	102	2840	27	5397	2840	2557	5286	111		2729	2557	240	
25	5830	2403	81	2322	3427	115	3312	28	5477	3312	2165	5286	191		3121	2165	353	
26	5810	2001	67	1934	3809	129	3680	29	5495	3680	1815	4955	540		3140	1815	315	
27	5782	2008	68	1940	3774	128	3646	30	5496	3646	1850	4886	610		3036	1850	286	
28	5810	2176	73	2103	3634	123	3511	1	5288	3511	1777	5001	287		3224	1777	522	
29	5211	2029	76	1953	3182	120	3062	2	4805	3062	1743	4840		35	3097	1743	406	
30	4960	1485	59	1426	3475	137	3338	3	4438	3338	1100	4030	408		2930	1100	522	
31																		
Totals	97034	129644	4750	60959	31325	1130	30195		96790	30195	66595	100601	2047	16897	44945	55656	7175	7031
Acre-feet	194068	259288	9500	121918	62650	2260	60390		193580	60390	133190	201202	4094	33794	89890	111312	14350	14062

(b) Pathfinder, inflow June 1 to 19.

June 3, Maximum inflow.
June 18, Maximum storage.

(a) Column 14, direct flow stored in Guernsey Reservoir, 21,878 acre-feet, not out-of-priority.

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July Evaporation Charge,
Pathfinder Dam to Guernsey Dam,
215 Second-Feet.

JULY 1936

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

Sheet 4, Nebraska Exhibit 306.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain	
MONTH	DIRECT FLOW				STORED WATER												Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	4625	1547	72	1475	3078	143	2935	4	4358	2935	1423	4232	126		2809	1423	267	
2	4558	1548	73	1475	3010	142	2868	5	4369	2868	1501	4253	116		2752	1501	189	
3	4537	1255	59	1196	3282	156	3126	6	4283	3126	1157	4253	30		3096	1157	254	
4	4530	1126	53	1073	3404	162	3242	7	4328	3242	1086	4232	96		3146	1086	202	
5	4523	1017	48	969	3506	167	3339	8	4291	3339	952	4130	161		3178	952	232	
6	4502	764	36	728	3738	179	3559	9	4262	3559	703	4232	30		3529	703	240	
7	4474	854	41	813	3620	174	3446	10	4282	3446	836	4337		55	3501	836	192	
8	4446	652	32	620	3794	183	3611	11	4266	3611	655	4422		156	3767	655	180	
9	4523	530	25	505	3993	190	3803	12	4366	3803	563	4316	50		3753	563	157	
10	4537	488	23	465	4049	192	3857	13	4598	3857	741	4190	408		3449	741		61
11	4516	491	23	468	4025	192	3833	14	4848	3833	1015	3890	958		2875	1015		332
12	4481	495	24	471	3986	191	3795	15	4634	3795	889	4110	524		3271	839		153
13	4432	806	39	767	3626	176	3450	16	4319	3450	869	3890	429		3021	869	113	
14	4425	1718	83	1635	2707	132	2575	17	4361	2575	1786	4190	171		2404	1786	64	
15	4552	1835	86	1749	2717	129	2588	18	4352	2588	1764	4190	162		2426	1764	200	
16	4551	1510	71	1439	3041	144	2897	19	4233	2897	1336	3830	403		2494	1336	318	
17	4086	1410	74	1336	2676	141	2535	20	3900	2535	1365	3890	10		2525	1365	186	
18	4026	1108	59	1049	2918	156	2762	21	3854	2762	1092	3950		96	2858	1092	172	
19	3998	954	51	903	3044	164	2880	22	4015	2880	1135	3970	45		2835	1135		17
20	3977	845	46	799	3132	169	2963	23	3849	2963	886	3733	116		2847	886	128	
21	4010	783	42	741	3227	173	3054	24	3797	3054	743	3676	121		2983	743	213	
22	3991	864	47	817	3127	168	2959	25	3782	2959	823	3600	182		2777	823	209	
23	3977	716	39	677	3261	176	3085	26	3625	3085	540	3600	25		3060	540	352	
24	3631	763	45	718	2868	170	2698	27	3503	2698	805	3564		61	2759	805	128	
25	3615	540	32	508	3075	183	2892	28	3406	2892	514	3456		50	2942	512	209	
26	3596	536	32	504	3060	183	2877	29	3321	2877	444	3528		207	3084	444	275	
27	3604	529	32	497	3075	183	2892	30	3407	2892	515	3492		85	2977	515	197	
28	3596	382	23	359	3214	192	3022	31	3452	3022	430	3366	86		2936	430	144	
29	3570	401	24	377	3169	191	2978	1	3466	2978	488	3330	136		2842	488	104	
30	3679	418	24	394	3261	191	3070	2	3484	3070	414	3312	172		2898	414	195	
31	3660	623	37	586	3037	178	2859	3	3572	2859	713	3339	242		2617	713	88	
Totals	129228	27508	1393	26113	101720	5270	96450		124583	96450	28133	120494	4799	710	92361	28133	5208	563
Acre-feet	258456	55016	2786	52226	203440	10540	192900		249166	192900	56266	240988	9598	1420	184722	56266	10416	1126

Tightly Bound

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August Evaporation Charge, Pathfinder Dam to Guernsey Dam, 187 Second-Feet.

AUGUST 1936

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

Sheet 5, Nebraska Exhibit 306.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain	
MONTH	DIRECT FLOW				STORED WATER												Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss − Col. 2-10	Gain + Col. 10-2
1	3635	780	40	740	2855	147	2708	4	3558	2708	850	2958	600		2108	850	77	
2	3602	801	41	760	2801	146	2655	5	3518	2655	863	2465	1053		1602	863	84	
3	3570	964	51	913	2606	136	2470	6	3301	2470	831	2555	746		1724	831	269	
4	3076	1635	99	1536	1441	88	1353	7	2953	1353	1600	3155		392	1555	1600	123	
5	3127	1813	159	1654	324	28	296	8	2346	296	2050	3006		660	956	2050		209
6	2060	1640	149	1491	420	38	382	9	2214	382	1832	3121		907	1289	1832		154
7	2856	1359	89	1270	1497	98	1399	10	2836	1399	1437	3038		202	1601	1437	20	
8	3006	1286	80	1206	1720	107	1613	11	2913	1613	1300	3170		257	1870	1300	93	
9	2988	1141	71	1070	1847	116	1731	12	2960	1731	1229	3348		388	2119	1229	28	
10	3001	1024	64	960	1977	123	1854	13	2978	1854	1124	3910		932	2786	1124	23	
11	2153	827	72	755	1326	115	1211	14	2638	1211	1427	3752		1114	2325	1427		485
12	3078	890	54	836	2188	133	2055	15	2928	2055	873	3850		922	2977	873	150	
13	3060	612	37	575	2448	150	2298	16	2938	2298	640	3870		932	3230	640	122	
14	3024	680	42	638	2344	145	2199	17	2865	2199	666	3752		887	3086	666	159	
15	3656	548	28	520	3108	159	2949	18	3538	2949	589	3850		312	3261	589	118	
16	3810	651	32	619	3159	155	3004	19	3497	3004	493	3890		393	3397	493	313	
17	3765	656	33	623	3109	154	2955	20	3538	2955	583	3890		352	3307	583	227	
18	3820	467	23	444	3353	164	3189	21	3650	3189	461	3695		45	3234	461	170	
19	3765	407	20	387	3358	167	3191	22	3693	3191	502	3456	237		2954	502	72	
20	3773	381	19	362	3392	168	3224	23	3733	3224	509	3350	383		2841	509	40	
21	3895	363	17	346	3532	170	3362	24	3765	3362	403	3312	453		2909	403	130	
22	3830	338	16	322	3492	171	3321	25	3688	3321	367	3366	322		2999	367	142	
23	3842	325	16	309	3517	171	3346	26	3609	3346	263	3312	297		3049	263	233	
24	3752	300	15	285	3452	172	3280	27	3595	3280	315	3223	372		2908	315	157	
25	3807	280	14	266	3527	173	3354	28	3770	3354	416	3276	494		2860	416	37	
26	3962	260	12	248	3702	175	3527	29	3847	3527	320	3172	675		2852	320	115	
27	4047	240	11	229	3807	176	3631	30	3777	3631	146	3172	605		3026	146	270	
28	3858	220	11	209	3638	176	3462	31	3658	3462	196	3240	418		3044	196	200	
29	3641	200	10	190	3441	177	3264	1	3465	3264	201	3294	171		3093	201	176	
30	3407	200	11	189	3207	176	3031	2	3198	3031	167	3384		186	3217	167	209	
31	3138	200	12	188	2938	175	2763	3	3002	2763	239	3258		256	3019	239	136	
Totals	105014	21483	1348	20140	83526	4449	79077		101969	79077	22892	104090	6826	8947	81198	22892	3893	848
Acre-feet	210028	42976	2696	40280	167052	8898	158154		203938	158154	45784	208180	13652	17890	162396	45784	7786	1696

Tightly Bound

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September Evaporation Charge,
Pathfinder Dam to Guernsey Dam,
[illegible] Second-Feet.

SEPTEMBER 1936
NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM
SEGREGATION DIRECT FLOW AND STORED WATER
Corrected For River Channel Evaporation Losses
R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer
VALUES IN SECOND-FEET

Sheet 6, Nebraska Exhibit 306.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW																River Loss or Gain	
MONTH	DIRECT FLOW				STORED WATER				GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Nebr. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 3-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.		Re-storage Guernsey Col. 10-15	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	2832	200	10	190	2632	128	2504	4	2788	2504	284	2894			106	2610	284	44	
2	2518	186	10	176	2332	128	2204	5	2554	2204	350	2766			212	2416	350		36
3	2242	182	11	171	2061	127	1934	6	2282	1934	348	2846			564	2498	348		39
4	2015	186	13	173	1829	125	1704	7	2076	1704	372	2380			304	2008	372		61
5	1763	213	17	196	1550	121	1429	8	1922	1429	493	1897		25		1404	493		159
6	1557	217	19	198	1340	119	1221	9	1736	1221	515	1444		292		929	515		179
7	1329	200	21	179	1129	117	1012	10	1574	1012	562	1433		141		871	562		245
8	1096	209	26	183	887	112	775	11	1366	775	591	1497			131	906	591		270
9	917	209	31	178	708	107	601	12	1224	601	623	1194		30		571	623		307
10	825	192	32	160	633	106	527	13	1102	527	575	880		222		305	575		277
11	794	186	32	154	648	106	502	14	1116	502	614	440	(a) 174	502		0	440		322
12	168	*264	138	30	0	0	0	15	974	0	974	369	605			0	369		806
13	200	*243	138	62	0	0	0	16	737	0	737	440	297			0	440		537
14	206	*215	138	68	0	0	0	17	582	0	582	410	172			0	410		376
15	206	*216	138	68	0	0	0	18	439	0	439	404	35			0	404		233
16	206	*212	138	68	0	0	0	19	468	0	468	410	58			0	410		262
17	206	*230	138	68	0	0	0	20	457	0	457	381	76			0	381		251
18	225	*245	138	87	0	0	0	21	432	0	432	346	86			0	346		207
19	246	236	132	104	10	6	4	22	406	4	402	346	56	4		0	346		160
20	248	238	130	108	15	8	7	23	454	7	447	358	89	7		0	358		206
21	248	227	126	101	21	12	9	24	389	9	380	364	16	9		0	364		141
22	235	224	132	92	11	6	5	25	425	5	420	375	45	5		0	375		190
23	221	221	138	83	0	0	0	26	457	0	457	381	76			0	381		236
24	220	*224	138	82	0	0	0	27	432	0	432	341	91			0	341		212
25	220	215	135	80	5	3	2	28	448	2	446	352	94	2		0	352		228
26	220	*229	138	82	0	0	0	29	480	0	480	404	76			0	404		260
27	220	*220	138	82	0	0	0	30	449	0	449	404	45			0	404		229
28	220	*275	138	82	0	0	0	1	417	0	417	341	76			0	341		197
29	208	*278	138	70	0	0	0	2	426	0	426	330	96			0	330		218
30	201	*269	138	63	0	0	0	3	362	0	362	296	(a) 66			0	296		161
31																			
Totals	22013	6726	2309	3433	15771	1331	14440		28974	14440	14534	26723	(a) 2329	1239	1317	14518	12205	44	7005
Acre-feet	44026	13452	5618	6866	31542	2662	28880		57948	28880	29068	53446	4658	2478	2634	29036	24410	88	14010

* Pathfinder Inflow; same days some direct flow stored in Pathfinder Reservoir, 968 acre-feet.

(a) Column 14. direct flow stored in Guernsey Reservoir, 4658 acre-feet.

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May Evaporation Charge,
Pathfinder Dam to Guernsey Dam,
140 Second-Feet.

MAY 1932

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

Sheet 1, Nebraska Exhibit 417.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain	
MONTH	DIRECT FLOW				STORED WATER												Path. D.-Guern. D.	
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	0	3200		0	0		0	4	1126	0	1126	1280		154	154	1126		1126
2	0	3210		0	0		0	5	1451	0	1451	1140	(a) 311			1140		1451
3	0	3240		0	0		0	6	2088	0	2088	1020	1068			1020		2088
4	0	3060		0	0		0	7	2308	0	2308	947	1361			947		2308
5	0	3340		0	0		0	8	2405	0	2405	1000	1405			1000		2405
6	0	3880		0	0		0	9	2289	0	2289	1070	1219			1070		2289
7	0	5680		0	0		0	10	2038	0	2038	1040	998			1040		2038
8	0	5540		0	0		0	11	2004	0	2004	1060	944			1060		2004
9	0	5130		0	0		0	12	1964	0	1964	1080	884			1080		1964
10	0	5260		0	0		0	13	1993	0	1993	1160	833			1160		1993
11	0	5530		0	0		0	14	2063	0	2063	1280	783			1280		2063
12	0	6070		0	0		0	15	2070	0	2070	1910	160			1910		2070
13	0	7070		0	0		0	16	2027	0	2027	1990	37			1990		2027
14	0	8140		0	0		0	17	2168	0	2168	1980	(a) 188			1980		2168
15	0	8680		0	0		0	18	1961	0	1961	2090		129	129	1961		1961
16	0	9640		0	0		0	19	1605	0	1605	2170		565	565	1605		1605
17	0	9760		0	0		0	20	1533	0	1533	2380		847	847	1533		1533
18	0	9090		0	0		0	21	1282	0	1282	2830		1548	1548	1282		1282
19	0	8550		0	0		0	22	1556	0	1556	2940		1384	1384	1556		1556
20	70	8610	70	0	0		0	23	1304	0	1304	3100		1796	1796	1304		1234
21	530	9080	140	390	0		0	24	1316	0	1316	3350		2034	2034	1316		786
22	940	10500	140	800	0		0	25	1596	0	1596	3870		2274	2274	1596		656
23	960	11410	140	820	0		0	26	1786	0	1786	4090		2304	2304	1786		826
24	2080	12060	140	1940	0		0	27	2645	0	2645	4380		1735	1735	2645		565
25	3200	11920	140	3060	0		0	28	3747	0	3747	4490		743	743	3747		547
26	3780	11310	140	3640	0		0	29	4512	0	4512	4530		18	18	4512		732
27	4250	9900	140	4110	0		0	30	4498	0	4498	4550		52	52	4498		248
28	4180	9170	140	4040	0		0	31	4463	0	4463	4550		87	87	4463		283
29	4170	8190	140	4030	0		0	1	4387	0	4387	4490		103	103	4387		217
30	4170	6800	140	4030	0		0	2	4533	0	4533	4420	(a) 113			4420		363
31	4560	6770	140	4420	0		0	3	4657	0	4657	4470	(a) 187			4470		97
Totals	32890	229790	1610	31280	0		0		75375	0	75375	80657	(a)10491	15773	15773	64884		42485
Acre-feet	65780	459580	3220	62560	0		0		150750	0	150750	161314	(a)20982	31546	31546	129768		84970

(a) Storage direct flow.

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June Evaporation Charge,
Pathfinder Dam to Guernsey Dam,
196 Second-Feet.

JUNE 1932

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

Sheet 2, Nebraska Exhibit 417.

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW																	River Loss or Gain
MONTH	DIRECT FLOW				STORED WATER				GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW					Path. D.-Guern. D.
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	4640	6360	196	4444	0		0	4	4607	0	4607	4470	(a) 137			4470	33	
2	4640	6990	196	4444	0		0	5	4817	0	4817	4360	457			4360		177
3	5080	6590	196	4884	0		0	6	5118	0	5118	4490	628			4490		38
4	5330	6690	196	5134	0		0	7	5115	0	5115	4860	(a) 255			4860	215	
5	5310	6070	196	5114	0		0	8	5141	0	5141	5260		119	119	5141	169	
6	5310	6380	196	5114	0		0	9	5157	0	5157	5450		293	293	5157	153	
7	5320	7160	196	5124	0		0	10	5109	0	5109	5820		711	711	5109	211	
8	5310	7700	196	5114	0		0	11	5501	0	5501	5950		449	449	5501		191
9	5740	7080	196	5544	0		0	12	5532	0	5532	5950		418	418	5532	208	
10	5720	7520	196	5524	0		0	13	5957	0	5957	5650	(a) 307			5650		237
11	6450	7630	196	6254	0		0	14	5848	0	5848	5550	298			5550	602	
12	6170	6980	196	5974	0		0	15	5816	0	5816	5700	116			5700	354	
13	6210	6650	196	6014	0		0	16	5830	0	5830	5500	330			5500	380	
14	6260	7760	196	6064	0		0	17	5810	0	5810	5020	790			5020	450	
15	6270	7710	196	6074	0		0	18	5688	0	5688	4930	758			4930	582	
16	6060	7000	196	5864	0		0	19	5824	0	5824	4890	934			4890	226	
17	6110	7780	196	5914	0		0	20	5679	0	5679	4620	1059			4620	431	
18	6070	8360	196	5874	0		0	21	5808	0	5803	4600	1203			4600	267	
19	6170	8660	196	5974	0		0	22	5741	0	5741	4580	1161			4580	429	
20	6190	8210	196	5994	0		0	23	5541	0	5541	4660	881			4660	649	
21	5600	7690	196	5404	0		0	24	5154	0	5154	4800	354			4800	446	
22	5490	7340	196	5294	0		0	25	5251	0	5251	5020	231			5020	239	
23	5500	7060	196	5304	0		0	26	5376	0	5376	5310	(a) 66			5310	124	
24	5500	7420	196	5304	0		0	27	5400	0	5400	5530		130	130	5400	100	
25	5500	7590	196	5304	0		0	28	5532	0	5532	5880		348	348	5532		32
26	5500	7570	196	5304	0		0	29	5784	0	5784	5920		136	136	5784		284
27	5510	7770	196	5314	0		0	30	5511	0	5511	6050		539	539	5511		1
28	5520	7370	196	5324	0		0	1	5480	0	5480	6050		570	570	5480	40	
29	5530	7340	196	5334	0		0	2	5431	0	5431	6080		649	649	5431	99	
30	5500	8930	196	5304	0		0	3	5679	0	5679	6100		421	421	5679		179
31																		
Totals	169510	219460	5880	163630	0		0		164232	0	164232	159050	9965	4783	4783	154267	6417	1139
Acre-feet	339020	438920	11760	327260	0		0		328464	0	328464	318100	19930	9566	9566	308534	12834	2278

(a) Storage direct flow.

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July Evaporation Charge,
Pathfinder Dam to Guernsey Dam,
215 Second-Feet.

JULY 1932

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

Sheet 3, Nebraska Exhibit 417.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW																River Loss or Gain	
MONTH	DIRECT FLOW				STORED WATER				GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				Path. D.-Guern. D.	
	Total Outflow Nebr. Ex. 7	Gross Neb. Ex. 6	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex. 8-A	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex. 8	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss − Col. 2-10	Gain + Col. 10-2
1	6000	6960	215	6745	0	0	0	4	5820	0	5820	6620		800	800	5820	180	
2	6030	6630	215	6415	0	0	0	5	5831	0	5831	6620		789	789	5831	199	
3	6020	5740	205	5535	280	10	270	6	5793	270	5523	6230		437	707	5523	227	
4	6010	5680	203	5477	330	12	318	7	5767	318	5449	6210		443	761	5449	243	
5	6010	4730	169	4561	1280	46	1234	8	5733	1234	4499	6080		347	1581	4499	277	
6	6010	4460	160	4300	1550	55	1495	9	5744	1495	4249	6100		356	1851	4249	266	
7	6010	4030	144	3886	1980	71	1909	10	5725	1909	3816	6130		405	2314	3816	285	
8	6010	3270	117	3153	2740	98	2642	11	5735	2642	3093	6130		395	3037	3093	275	
9	6010	2820	101	2719	3190	114	3076	12	5855	3076	2779	6100		245	3321	2779	155	
10	6010	2460	88	2372	3550	127	3423	13	5776	3423	2353	6310		534	3957	2353	234	
11	6000	2640	95	2545	3360	120	3240	14	5749	3240	2500	6340		600	3840	2500	260	
12	5990	2090	75	2015	3900	140	3760	15	5688	3760	1928	5980		292	4052	1928	302	
13	5980	1880	68	1812	4100	147	3953	16	5678	3953	1725	5900		222	4175	1725	302	
14	5970	1750	63	1687	4220	152	4068	17	5754	4068	1686	5850		90	4164	1686	216	
15	5960	2010	72	1938	3950	143	3807	18	5819	3807	2012	5880		61	3868	2012	141	
16	6230	2240	77	2163	3990	138	3852	19	5956	3852	2104	5900	56		3796	2104	274	
17	6280	1960	67	1893	4320	148	4172	20	5925	4172	1753	5920	5		4167	1753	355	
18	6260	1850	63	1787	4410	152	4258	21	5906	4258	1648	5780	126		4132	1648	354	
19	6240	1760	61	1699	4480	154	4326	22	5886	4326	1560	5700	186		4140	1560	354	
20	6230	1740	60	1680	4490	155	4335	23	5867	4335	1532	5650	217		4118	1582	363	
21	6220	1720	59	1661	4500	156	4344	24	5877	4344	1533	5620	257		4087	1533	343	
22	6200	1680	58	1622	4520	157	4363	25	5925	4363	1562	5500	425		3938	1562	275	
23	6280	1350	46	1304	4930	169	4761	26	5993	4761	1232	5600	393		4368	1232	287	
24	6270	1650	57	1593	4620	158	4462	27	5968	4462	1506	5550	418		4044	1506	302	
25	6240	1280	44	1236	4960	171	4789	28	5866	4789	1077	5480	386		4403	1077	374	
26	6210	1560	54	1506	4650	161	4489	29	5908	4489	1419	5450	458		4031	1419	302	
27	6180	1390	48	1342	4790	167	4623	30	5976	4623	1353	5410	566		4057	1353	204	
28	6250	1070	37	1033	5180	178	5002	31	5997	5002	995	5380	617		4285	995	253	
29	6260	1220	42	1178	5040	173	4867	1	5999	4867	1132	5330	669		4198	1132	261	
30	6230	1370	47	1323	4860	168	4692	2	5981	4692	1289	4730	1251		3441	1289	249	
31	5920	1240	45	1195	4680	170	4510	3	5403	4510	893	3240	2163		2347	893	517	
Totals	189520	82230	2855	79375	108850	3810	105040		180891	105040	75851	178720	8193	6022	102869	75851	8629	
Acre-feet	379040	164460	5710	158750	217700	7620	210080		361782	210080	151702	357440	16386	12044	205738	151702	17258	

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August Evaporation Charge, Pathfinder Dam to Guernsey Dam, 187 Second-Feet.

AUGUST 1932

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

Sheet 4, Nebraska Exhibit 417.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain Path. D.-Guern. D.	
MONTH	DIRECT FLOW				STORED WATER													
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Restorage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	5800	1420	46	1374	4380	141	4239	4	5416	4239	1177	3510	1906		2333	1177	384	
2	5760	1020	33	987	4740	154	4586	5	4113	(a)4113	0	3400	713		3400	0	1647	
3	3480	860	46	814	2620	141	2479	6	3576	2952	624	3420	156		2796	624		96
4	3500	1350	72	1278	2150	115	2035	7	3532	2035	1497	3460	72		1963	1497		32
5	3500	1420	76	1344	2080	111	1969	8	3507	1969	1538	3490	17		1952	1538		7
6	3500	980	52	928	2520	135	2385	9	3492	2385	1107	3490	2		2383	1107	8	
7	3490	680	36	644	2810	151	2659	10	3495	2659	836	3510		15	2674	836		5
8	3490	930	50	880	2560	137	2423	11	3546	2423	1123	3730		184	2607	1123		56
9	3480	1050	56	994	2430	131	2299	12	3370	2299	1071	3970		600	2899	1071	110	
10	3480	890	48	842	2590	139	2451	13	3462	2451	1011	4270		808	3259	1011	18	
11	3470	510	28	482	2960	159	2801	14	3791	2801	990	4530		739	3540	990		321
12	4150	640	29	611	3510	158	3352	15	4435	3352	1083	4910		475	3827	1083		285
13	4560	730	30	700	3830	157	3673	16	4462	3673	789	5000		538	4211	789	98	
14	4570	660	27	633	3910	160	3750	17	4729	3750	979	5050		321	4071	979		159
15	4560	420	17	403	4140	170	3970	18	5007	3970	1037	4890	117		3853	1037		447
16	5160	480	17	463	4680	170	4510	19	5002	4510	492	4930	72		4438	492	158	
17	5200	790	28	762	4410	159	4251	20	4997	4251	746	5050		53	4304	746	203	
18	5190	570	21	549	4620	166	4454	21	5017	4454	563	5050		33	4487	563	173	
19	5150	640	23	617	4510	164	4346	22	4986	4346	640	5050		64	4410	640	164	
20	5110	600	22	578	4510	165	4345	23	4987	4345	642	5050		63	4408	642	123	
21	5120	590	22	568	4530	165	4365	24	4964	4365	599	5040		76	4441	599	156	
22	5080	470	17	453	4610	170	4440	25	4929	4440	489	5070		141	4581	489	151	
23	5050	390	14	376	4660	173	4487	26	4962	4487	475	5020		58	4545	475	88	
24	5030	420	16	404	4610	171	4439	27	5388	4439	949	4960	428		4011	949		358
25	5060	510	19	491	4550	168	4382	28	5244	4382	862	4890	354		4028	862		184
26	5030	390	14	376	4640	173	4467	29	5146	4467	679	4820	326		4141	679		116
27	5000	350	13	337	4650	174	4476	30	5036	4476	560	4960	76		4400	560		36
28	5160	440	16	424	4720	171	4549	31	5004	4549	455	4820	184		4365	455	156	
29	5170	370	13	357	4800	174	4626	1	4724	4626	98	4770		46	4672	98	446	
30	4580	280	11	269	4300	176	4124	2	4549	4124	425	4620		71	4195	425	31	
31	4530	340	14	326	4190	173	4017	3	4489	4017	472	4550		61	4078	472	41	
Totals	141410	21190	926	20264	120220	4871	115349		139357	115349	24008	139280	3423	4346	115272	24008	4155	2102
Acre-feet	282820	42380	1852	40528	240440	9742	330698		278714	230698	48016	278560	8846	8692	230544	48016	8310	4204

(a) Excess carried into following day.

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September Evaporation Charge, Pathfinder Dam to Guernsey Dam, 138 Second-Feet.

SEPTEMBER 1932

NORTH PLATTE RIVER, PATHFINDER DAM TO GUERNSEY DAM

SEGREGATION DIRECT FLOW AND STORED WATER

Corrected For River Channel Evaporation Losses

R. I. Meeker, Consulting Engineer, M. E. Ball, Assistant Engineer

VALUES IN SECOND-FEET

. Sheet 5, Nebraska Exhibit 417.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	PATHFINDER RESERVOIR OUTFLOW								GUERNSEY RESERVOIR INFLOW				GUERNSEY RESERVOIR OUTFLOW				River Loss or Gain Path. D.-Guern. D.	
MONTH	DIRECT FLOW				STORED WATER													
	Total Outflow Nebr. Ex.	Gross Neb. Ex.	Evap. Charge	Net at Guernsey Res.	Gross Col. 2-3	Evap. Charge	Net at Guernsey Res.	3 Day Lag	Total Inflow Nebr. Ex.	Stored Water Col. 8	Direct Flow Col. 10-11	Total Outflow Nebr. Ex.	Re-storage Guernsey Col. 10-13	Guernsey Stor. Rel. Col. 13-10	Stored Water Col. 11-14 or Col. 11+15	Direct Flow Col. 13-16	Loss — Col. 2-10	Gain + Col. 10-2
1	4500	330	10	320	4170	128	4042	4	4451	4042	409	4530		79	4121	409	49	
2	4480	390	12	378	4090	126	3964	5	4436	3964	472	4530		94	4058	472	44	
3	4460	290	9	281	4170	129	4041	6	4431	4041	390	4580		99	4140	390	29	
4	4430	120	4	116	4310	134	4176	7	4421	4176	245	4530		109	4285	245	9	
5	4410	310	10	300	4100	128	3972	8	4409	3972	437	4510		101	4073	437	1	
6	4480	420	13	407	4060	125	3935	9	4419	3935	484	4510		91	4026	484	61	
7	4460	190	6	184	4270	132	4138	10	4490	4138	352	4510		20	4158	352		30
8	4540	100	3	97	4440	135	4305	11	3830	*3830	0	4510		680	4510	0	710	
9	3510	220	9	211	3290	129	3161	12	4031	3636	395	4440		409	4045	395		521
10	3950	210	7	203	3740	131	3609	13	3961	3609	352	4250		289	3898	352		11
11	3930	160	6	154	3770	132	3638	14	3964	3638	326	4090		126	3764	326		34
12	3900	50	2	48	3850	136	3714	15	3929	3714	215	4030		101	3815	215		29
13	3890	70	2	68	3820	136	3684	16	3800	3684	116	3830		30	3714	116	90	
14	3630	100	4	96	3530	134	3396	17	3572	3396	176	3640		68	3464	176	58	
15	3520	110	4	106	3410	134	3276	18	3539	3276	263	3600		61	3337	263		19
16	3500	260	10	250	3240	128	3112	19	3497	3112	385	3580		83	3195	385	3	
17	3480	160	6	154	3320	132	3188	20	3455	3188	267	3550		95	3283	267	25	
18	3470	280	11	269	3190	127	3063	21	3461	3063	398	3640		179	3242	398	9	
19	3450	250	10	240	3200	128	3072	22	3447	3072	375	3710		263	3335	375	3	
20	3520	160	6	154	3360	132	3228	23	3479	3228	251	3600		121	3349	251	41	
21	3510	310	12	298	3200	126	3074	24	3522	3074	448	3490		32	3042	448		12
22	3490	220	9	211	3270	129	3141	25	3561	3141	420	3380		181	2960	420		71
23	3530	210	8	202	3320	130	3190	26	3546	3190	356	3220		326	2864	356		16
24	3500	290	11	279	3210	127	3083	27	3593	3083	510	2960		633	2450	510		93
25	3450	410	16	394	3040	122	2918	28	3360	2918	442	2680		680	2238	442	90	
26	3420	380	15	365	3040	123	2917	29	3216	2917	299	2390		826	2091	299	204	
27	2790	420	21	399	2370	117	2253	30	2684	2253	431	1830		854	1399	431	106	
28	1700	250	20	230	1450	118	1332	1	1937	1332	605	1060		877	455	605		237
29	720	460	88	372	260	50	210	2	1426	210	1216	1103	(a) 113	210	0	1108		706
30	590	530	124	406	60	14	46	3	1118	46	1072	1103		15	31	1072		528
31																		
Totals	106210	7660	468	7192	98550	3672	94878		106985	94878	12107	105336	(a) 113	4634	3098	93342	11994	1532	2307
Acre-feet	212420	15320	936	14384	197100	7344	189756		213970	189756	24214	210672	226	9268	6196	186684	23988	3064	4614

* Excess carried into following day.

(a) Direct flow stored in Guernsey Reservoir.

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Nebraska Exhibit 429

BEFORE THE
STATE ENGINEER OF WYOMING.

191

Patrick	Cirenes
Mead	Margold
Roddis	Walters
Thomas	Burlew

IN THE MATTER OF PERMIT NO. 18488 } Petition of the Secretary of the Interior of the United States.

Comes now the Secretary of the Interior of the United States of America, and respectfully avers:

I.

The Secretary of the Interior of the United States of America is the applicant named in that certain application filed in the office of the State Engineer of Wyoming, on or about the 6th day of December, A. D. 1904, for the construction of the Casper Canal, which said application was accepted and assigned temporary filing No. 5-3-83, in the records of the office of said State Engineer.

II.

The said original application, temporary filing No. 5-3-83, was returned by the Honorable Edwin W. Burritt, State Engineer of Wyoming, on the 5th day of July, A. D. 1934, for correction, to Harry W. Bashore, Construction Engineer, United States Bureau of Reclamation, Casper, Wyoming, said person and bureau acting and functioning under the jurisdiction of the Secretary of the Interior of the United States of America. In con-

formity to the instructions of said State Engineer and pursuant thereto, the said original application was corrected and refiled in the office of the State Engineer of Wyoming, on or about the 27th day of July, A. D., 1934.

III.

The said original application, temporary filing No. 5-3-83, as corrected, described certain arid lands in Natrona County, Wyoming, within the Casper-Alcova Federal Reclamation Project, which project was approved for construction under the provisions of the act of June 16, 1933 (48 Stat., 195), commonly known as the National Industrial Recovery Act, by the Honorable, the President of the United States, on the 28th day of July, A. D. 1933, and funds for the construction thereof, on the 1st day of August, A. D. 1933, were allotted by the Federal Emergency Administrator of Public Works, to the United States Bureau of Reclamation, for the construction of said project under the Act of June 17, 1902 (32 Stat. 388), as amended and supplemented, commonly known as the Reclamation Law.

IV.

On the 14th day of September A. D., 1934, the Honorable Edwin W. Burritt, State Engineer of Wyoming, granted said original application as corrected, and recorded the same in the records of his office, as Permit No. 18488, with endorsements, among others as follows:

"THIS PERMIT IS ISSUED SUBJECT TO ALL RIGHTS WHICH HAVE VESTED AND ACCRUED UNDER THE LAWS OF WYOMING, AS OF THIS DATE, TO THE USE OF THE WATERS OF THE NORTH PLATTE RIVER AND ITS TRIBUTARIES

ABOVE THE PATHFINDER DAM; THIS PERMIT SHALL BE LIMITED TO THE IRRIGATION OF NOT TO EXCEED 66,000 ACRES OF LAND; SAID ACREAGE TO BE SELECTED FROM THE LANDS DESCRIBED IN THE CORRECTED APPLICATION."

V.

Since the granting of said Permit No. 18488 with the endorsements quoted in Paragraph IV hereof, further and additional investigations of the quantity of water flowing in the North Platte River and its tributaries in Wyoming available for the irrigation of the lands of the Casper-Alcova Project, under said Permit No. 18488, conditioned as described in Paragraph IV hereof, have been made under the direction of the Federal Emergency Administrator of Public Works and, as a result of said investigations, the determination has been made to construct said Casper-Alcova Project in two units, and the United States Bureau of Reclamation has been instructed to proceed accordingly.

VI.

Accompanying the application to correct temporary filing No. 5-3-83, and as a part thereof, there were filed in the office of the State Engineer of Wyoming, on or about the 27th day of July, A. D. 1934, the following documents:

1 set of tracings of a map showing the legal subdivisions and estimated irrigable area thereof described in the corrected application.

1 print of the map above described.

1 set of prints of the legal subdivisions and estimated irrigable area thereof.

The said documents by this reference are made a part of this petition the same as if they were filed herewith.

VII.

The lands described in the documents to which reference is made in Paragraph VI hereof, and particularly, the irrigable area thereof, comprise the Casper-Alcova Federal Reclamation Project as approved and authorized for construction, as alleged in Paragraph III hereof.

VIII.

The first unit of said Casper-Alcova Project, which it is proposed to construct, embraces certain of the lands described in the application correcting temporary filing No. 5-3-83, and the documentary evidence accompanying the same, all of which was filed in the office of the State Engineer, on or about the 27th day of July, A. D. 1934, and which lands of said first unit, the irrigable area of which is about 40,580.5 acres, are particularly described in Exhibit "A" (Sheets 1-45) attached hereto, and by this reference made a part hereof the same as if set out herein at length.

IX.

The second unit of the Casper-Alcova Project, the irrigable area of which is about 41,683 acres, will comprise the remaining lands particularly described in the application to correct temporary filing No. 5-3-83, and the documentary evidence filed therewith, and which are not particularly described in Exhibit "A" attached hereto.

The construction of the second unit of said Casper-Alcova Project will follow the completion of the construction of the first unit of said project and the irriga-

tion thereof, if it is found that the quantity of water flowing in the North Platte River and its tributaries in Wyoming, is sufficient, with a supplemental supply of water from the Seminoe Reservoir, to satisfy the priority of the right to divert the natural flow of the North Platte River granted and recognized under the laws of Wyoming for the irrigation of the first and second units of said Casper-Alcova Project.

A particular description of the lands comprising the second unit of said project will be filed with the State Engineer of Wyoming prior to the commencement of the construction thereof.

X.

The irrigable area of the first unit stated in Paragraph VIII hereof to be 40,580.5 acres, and the irrigable area of the second unit stated in Paragraph IX hereof to be 41,683 acres, are estimates which will be corrected after the completion of the irrigation works common to the project as a whole and the irrigation works constructed to serve the first and second units of the project, a proper showing of which corrections will be filed in the office of the State Engineer of Wyoming after the correct irrigable area of each unit of the project has been determined.

XI.

The United States hereby gives notice that neither the filing of this petition nor any statement herein is to estop the United States in litigation affecting the waters of the North Platte River and its tributaries from making any claim to the ownership of said waters that may seem

justified by the Attorney General of the United States, whether or not such claim is consistent with the tenor of this petition or with any statements made herein.

WHEREFORE, your petitioner, the Secretary of the Interior of the United States of America, prays that:

(1) The application correcting temporary filing No. 5-3-83 be accepted and recognized by the State Engineer of Wyoming as an original application to divert and apply to the beneficial uses therein stated the natural flow of the North Platte river and its tributaries in Wyoming, and that the date of filing the same in the office of the State Engineer of Wyoming be fixed as the 27th day of July A. D., 1934, and the date of approval thereof by the State Engineer be recognized as the 14th day of September A. D., 1934.

(2) The endorsements on Permit No. 18488, quoted in Paragraph IV hereof, be removed from said permit and expunged therefrom and from the official records in the office of the State Engineer of Wyoming.

(3) Permit No. 18488 be recognized as a permit, with a priority date of the 27th day of July A. D., 1934, granted to the United States of America to divert and apply the natural flow of the North Platte river and its tributaries in Wyoming to the beneficial uses stated in said corrected application, and in particular for the irrigation of the arid lands in Natrona County, Wyoming, comprising the Casper-Alcova Federal Reclamation Project, and each unit thereof, said lands to be selected from the lands particularly described in the application correcting temporary filing No. 5-3-83, and found to be irrigable under the works of said Casper-Alcova Project or any unit thereof.

(4) The State Engineer of Wyoming authorizes the construction of said Casper-Alcova Project under Permit No. 18488 in two units.

(5) The permit requires the construction of the first unit of said Casper-Alcova Project to be commenced on or before the 14th day of September A. D., 1935.

(6) The date required for the completion of the ditches and other distributing works of the first unit of the said Casper-Alcova Project be fixed as the 14th day of September A. D., 1939.

(7) The date required to complete the application of water to the beneficial uses stated in the application for Permit No. 18488 on the first unit of said Casper-Alcova Project be fixed as the 14th day of September A. D., 1944.

(8) Final proof of appropriation of water to beneficial use on the first unit of said project be required to be submitted to the State Engineer of Wyoming on or before the 14th day of September A. D., 1949.

(9) The construction of the irrigation works common to both units of said Casper-Alcova Project to be accepted and recognized by the State Engineer of Wyoming as the commencement of construction of the second unit of said project, and that the completion of ditches and other distributing works peculiar to the second unit of said project, be completed within such extensions of time as may be allowed by the State Engineer of Wyoming from and after the 14th day of September A. D., 1934, and that the application of water to the beneficial uses stated in the application for Permit No. 18488 on the second unit of said Casper-Alcova Project, be completed

within such extensions of time as may be allowed by the State Engineer of Wyoming from and after the 14th day of September A. D., 1944, and that final proof of appropriation of water to beneficial use on the second unit of said Casper-Alcova Project be submitted to the State Engineer of Wyoming, within such extensions of time as may be allowed by the State Engineer of Wyoming, from and after the 14th day of September A. D., 1949.

Dated at the City of Washington, in the District of Columbia, this 21st day of February, A. D., 1935.

(Signed) Harold L. Ickes
Secretary of the Interior of the
United States of America.

CITY OF WASHINGTON }
DISTRICT OF COLUMBIA } ss.

I hereby certify that the foregoing petition was signed in my presence and sworn to before me by Harold L. Ickes this 26th day of February, A. D., 1935.

(Signed) W. H. Richard
Notary Public

My commission expires August 10, 1939.
(SEAL)

STATE OF WYOMING }
OFFICE OF STATE ENGINEER } ss.

This is to certify that I have examined the foregoing petition, and do hereby grant the prayer of the same in each particular thereof.

WITNESS my hand this 21st day of March A. D., 1935.

(Signed) Edwin W. Burritt,
State Engineer.

THE STATE OF WYOMING }
STATE ENGINEER'S OFFICE } ss.

This instrument was received and filed for record on the 21st day of March, A. D., 1935, at 4:50 o'clock P. M., and duly recorded in Book 8 of Miscellaneous Records, on page 191.

Edwin W. Burritt,
State Engineer.

Fee $11.35 paid.

(Exhibit "A" containing land description which was attached to this petition is filed in back of Miscellaneous Records, Book No. 8.)

CERTIFICATION.

UNITED STATES OF AMERICA }
STATE OF WYOMING } ss.

I, EDWIN W. BURRITT, of Cheyenne, Wyoming, the ruly appointed, qualified and acting State Engineer in and for the State of Wyoming, do hereby certify that the above and foregoing is a full, true and complete copy of Petition of the Secretary of the Interior of the United States of America in the matter of Permit No. 18488 in Book 8 of Miscellaneous Records on pages 191 to 196, inclusive, so full and complete as the original thereof appears on file and of record in my office except that it does not contain the land descriptions filed as Exhibit A with this petition.

IN WITNESS WHEREOF I have hereunto set my hand in the City of Cheyenne, in the State of Wyoming, on this 31st day of July, 1935.

(Signed) Edwin W. Burritt,
State Engineer.

PARAGRAPH 30 OF FINDINGS OF FACT BY UNITED STATES DISTRICT COURT IN UNITED STATES V. TILLEY FOUND ON PAGE 20, NEBRASKA EXHIBIT 593.

30. It was stipulated by Plaintiff and the District that for the purpose of this suit the District contains about, but not exceeding, 60,000 acres of irrigable lands; that in addition to the acreage within the District, about 3,000 acres without the District are irrigable from the District's canal under what are commonly referred to as "Preferred Rights"; that all these lands, aggregating about 63,000 acres, are covered by valid appropriations under what are known as Docket No. 918 and Application No. 660 in the files and records of the Bureau of Irrigation of the State of Nebraska, where the lands are described in detail, and that the appropriation covering the lands under Docket No. 918 has a priority date of September 16, 1887, and that the appropriation covering the lands under Application No. 660 has a priority date of April 14, 1902.

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Sheet 1, Wyoming Exhibit No. 88
Elmer K. Nelson, C. E.
1939

NORTH PLATTE RIVER

SEASON OF 1931-1932. SUMMARY OF STREAM FLOWS AND CANAL DIVERSIONS—IN ACRE-FEET

SHEET 1—1932 SECTION: BELOW WHALEN TO WYOMING NEBRASKA LINE

COMPILED FROM NEBRASKA HYDROGRAPHIC REPORTS, BUREAU OF RECLAMATION RECORDS, UNPUBLISHED, AND WYOMING STATE ENGINEER AND WATER COMMISSIONERS REPORTS

LINE DESCRIPTION	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	TOTALS Seasonal	Oct.-April	May-Sept.
WATER SUPPLY															
RIVER BELOW WHALEN	2560	2980	4152	5800	3840	6770	3370	43810	126590	143690	95600	53030	492192	29472	462720
Tributaries—Below Whalen to Wyo.-Nebr. Line Net...	14093	12491	18006	17487	17630	17444	17557	18556	13590	10010	9645	10580	177089	114708	62381
Tributaries	13490	11700	17514	17180	17400	17130	17170	16538	10125	5030	3795	4890	151962	111584	40378
Return Flows, Tributary	603	791	492	307	230	314	387	2018	3465	4980	5850	5690	25127	3124	22003
Canal Wastes	0	0	0	0	0	0	0	519	553	473	808	1045	3398	0	3398
Total Measured River Supply	16653	15471	22158	23287	21470	24214	20927	62366	140180	153700	105245	63610	669281	144180	525101
Apparent Net Channel Accretion	14797	7129	4142	3813	3630	886	3673	-7138	-6169	5562	14595	17066	61987	38070	23917
Net Sectional Accretion	28890	19620	22148	21300	21260	18330	21230	11418	8421	15572	24240	27646	239075	152778	86297
Total Available Supply	31450	22600	26300	27100	25100	25100	24600	55228	134011	159262	119840	80676	731267	182250	549017
TRIBUTARIES															
Laramie River	4560	6010	7440	7690	8740	8920	14200	13000	2670	1740	830	1040	76840	57560	19280
Single Power Return Less Laramie River Diversion...	5810	2950	8374	8568	7620	6240	1680	1958	5880	1940	605	1690	53315	41242	12073
Sawhide Creek	3120	2740	1700	922	1040	1970	1290	1580	1575	1350	2360	2160	21807	12782	9025
RETURN FLOWS															
Cherry Creek Drain								708	2300	3000	3400	3290	12698	0	12698
Latzer Drain	603	791	492	307	230	314	387	1310	1165	1980	2450	2400	12429	3124	9305
CANAL WASTES															
Cherry Creek Lateral Waste								62	87	123	121	140	533	0	533
Sand Draw								61	71	65	121	160	478	0	478
Sand Point								0	10	70	222	50	352	0	352
Allen Drain								62	60	62	65	120	369	0	369
Arnold Drain								334	325	153	279	575	1666	0	1666
DIVERSIONS															
Burbank Canal								137	392	337	313	178	1357	0	1357
Lucerne Canal								1230	3440	4170	3940	3120	15900	0	15900
Prattan Canal								592	1690	1410	1090	625	5407	0	5407
Rock Ranch Canal								103	2505	2510	2185	330	8233	0	8233
Torrington Canal								607	1465	2070	1815	1560	7517	0	7517
North Platte Canal								184	2420	3010	2760	1400	9774	0	9774
Narrows Ditch								24	177	178	180	100	659	0	659
Morris No. 1 Ditch															
Ranch Canal								0	1160	1560	1330	698	4748	0	4748
Mitchell Canal	1950							1570	10315	12490	11735	8810	46870	1950	44920
TOTAL DIVERSIONS—NET	1950	0	0	0	0	0	0	3928	23011	27262	24540	16376	97067	1950	95117
RIVER AT STATE LINE	29500	22600	26300	27100	25100	25100	24600	51300	111000	132000	95300	64300	634200	180300	453900

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Sheet 1, Wyoming Exhibit No. 20

NORTH PLATTE RIVER

Elmer K. Nelson, C. E.

SEASON OF 1933 - 1934. SUMMARY OF STREAM FLOWS AND CANAL DIVERSIONS—IN ACRE-FEET 1939

SHEET 1 — 1934 SECTION: BELOW WHALEN TO WYOMING NEBRASKA LINE

COMPILED FROM NEBRASKA HYDROGRAPHIC REPORTS, BUREAU OF RECLAMATION RECORDS, UNPUBLISHED, AND WYOMING STATE ENGINEER AND WATER COMMISSIONERS REPORTS

LINE DESCRIPTION	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	TOTALS Seasonal	TOTALS Oct.-April	TOTALS May-Sept.
WATER SUPPLY															
RIVER BELOW WHALEN	8860	6990	8740	5740	8757	11630	4390	46930	45436	34390	5328	2620	189811	55107	134704
Tributaries—Below Whalen to Wyo.-Nebr. Line Net...	12229	15844	17046	14845	10677	12323	8997	5913	12200	10570	6230	13085	139959	91961	47998
Tributaries	11430	15130	16370	14230	10310	11930	8640	5179	10952	9848	4800	12078	130897	88040	42857
Return Flows, Tributary	799	714	676	615	367	393	357	734	1248	722	1430	1007	9062	3921	5141
Canal Wastes	0	0	0	0	0	0	0	186	145	130	140	151	752	0	752
Total Measured River Supply	21089	22834	25786	20585	19434	23953	13387	52843	57636	44960	11558	15705	329770	147608	182702
Apparent Net Channel Accretion	18881	12036	9624	9675	6086	9107	7895	-3549	13244	7361	15639	13153	119152	73304	45848
Net Sectional Accretion	31110	27880	26670	24520	16763	21430	16892	2364	25444	17931	21869	26238	259111	165265	93846
Total Available Supply	39970	34870	35410	30260	25520	33060	21282	49294	70880	52321	27197	28858	448922	220872	228550
TRIBUTARIES															
Laramie River	2820	3730	4980	6380	4670	6340	4690	944	426	522	250	532	36284	33610	2674
Elgin Power Return Less Laramie River Diversion...	6700	9790	10040	6560	4640	4360	2760	3963	7295	8836	4074	10921	79939	44850	35089
Rawhide Creek	1910	1610	1850	1290	1000	1230	1190	272	3231	490	476	625	14674	9580	5094
RETURN FLOWS															
Cherry Creek Drain								486	720	434	754	674	3068	0	3068
Kaiser Drain	799	714	676	615	367	393	357	248	528	288	676	333	5994	3921	2073
CANAL WASTES															
Sand Draw								60	65	63	79	67	334	0	334
Sand Point															
Fuller Drain								61	60	61	61	60	303	0	303
Arnold Drain								65	20	6	0	24	115	0	115
DIVERSIONS															
Burbank Canal								280	180	147	48	151	786	0	786
Lacorne Canal								3382	3092	3007	3201	1976	14658	0	14658
Bridon Canal								744	841	464	1129	1103	4281	0	4281
Rock Ranch Canal								2126	2231	2557	1997	2456	11367	0	11367
Torrington Canal								1406	1396	819	1716	1466	6803	0	6803
North Platte Canal								2102	1956	2452	2791	1864	11165	0	11165
Narrows Ditch								12	14	0	10	67	103	0	103
Goris No. 1 Ditch															
Ranch Canal								1109	466	494	545	575	3189	0	3189
Mitchell Canal							3162	7799	9039	4961	6420	5641	37022	3162	33860
TOTAL DIVERSIONS—NET							3162	18754	19070	14771	17717	15148	98622	3162	95460
RIVER AT STATE LINE	39970	34870	35410	30260	25520	33060	18120	30540	51810	37550	9480	13710	350300	217210	143090

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SHEET 1 — 1936

Sheet 1, Wyoming Exhibit No. 92
Elmer K. Nelson, C. E.
1939

NORTH PLATTE RIVER

SEASON OF 1935 - 1936. SUMMARY OF STREAM FLOWS AND CANAL DIVERSIONS—IN ACRE-FEET

SECTION: BELOW WHALEN TO WYOMING NEBRASKA LINE

COMPILED FROM NEBRASKA HYDROGRAPHIC REPORTS, BUREAU OF RECLAMATION RECORDS, UNPUBLISHED, AND WYOMING STATE ENGINEER AND WATER COMMISSIONERS REPORTS

LINE DESCRIPTION	Oct.	Nov.	Dec.	Jan.	Febr	March	April	May	June	July	Aug.	Sept.	TOTALS Seasonal	TOTALS Oct.-April	May-Sept.
WATER SUPPLY															
IVER BELOW WHALEN	3560	1530	1000	710	690	2690	2370	86740	79610	90690	49960	12670	332220	12550	319670
Tributaries—Below Whalen to Wyo.-Nebr. Line Net	15921	16070	16726	16677	15788	17275	17802	11133	18270	12401	13173	18270	189506	116259	73247
Tributaries	14924	15285	16270	16248	15438	16816	17230	10070	16230	10862	10743	15980	176096	112211	63885
Return Flows, Tributary	997	785	456	429	350	459	572	1063	2040	1539	2430	2290	13410	4048	9362
anal Wastes	0	0	0	0	0	0	0	274	50	0	16	46	386	0	386
otal Measured River Supply	19481	17600	17726	17387	16478	19965	20172	97873	97880	103091	63133	30940	521726	128809	392917
pparent Net Channel Accretion	18111	10351	8395	6143	4622	5335	3430	-7946	5224	3870	13892	20843	92265	56387	35878
et Sectional Accretion	34032	26421	25121	22820	20410	22610	21232	3187	23494	16271	27065	39118	281781	172646	109135
otal Available Supply	37592	27951	26121	23530	21100	25300	23602	89927	103104	106961	77025	51788	614001	185196	428805
RIBUTARIES															
aramie Riv	3340	5080	4550	5790	5670	6120	12150	5260	8800	1030	803	1410	60003	42700	17303
ngle Power Return Less Laramie River Diversion	10590	9340	10620	9720	9240	9770	1000	3740	6180	8890	8740	12970	100800	60280	40520
awhide Creek	994	865	1100	738	528	926	4080	1070	1250	942	1200	1600	15293	9231	6062
ETURN FLOWS															
ery Creek Drain	625	413	224	214	171	238	282	553	1020	841	1360	1250	7191	2167	5024
ter Drain	372	372	232	215	179	221	290	510	1020	698	1070	1040	6219	1881	4338
ANAL WASTES															
nd Draw															
nd Point															
lue Drain															
ould Drain															
								274	50	0	16	46	386	0	386
IVERSIONS															
rbank Canal								179	248	182	113	24	746	0	746
ose Canal								3923	3709	3941	3909	3471	18953	0	18953
tina Canal								1349	958	1113	1126	627	5172	0	5172
k Ranch Canal								2535	2523	3068	2477	1920	12523	0	12523
rington Canal								2253	1615	2174	1980	1498	9520	0	9520
rth Platte Canal								2460	2477	3144	2886	2271	13178	0	13178
rown Ditch								97	54	83	75	16	325	0	325
rie No. 1 Ditch								NO	RECORD						
nch Canal								1295	881	1226	1220	1073	5695	0	5695
kell Canal	9412	9521	2261				252	10470	8109	6480	4056	1414	51975	21446	30529
TAL DIVERSIONS—NET	9412	9521	2261	0	0	0	252	24287	20524	21411	17765	12268	117701	21446	96255
VER AT STATE LINE	28180	18430	23860	23530	21100	25300	23350	65640	82580	85550	59260	39520	496300	163750	332550

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LIST OF WATER RIGHTS IN JACKSON COUNTY, COLORADO
IRRIGATION DIVISION NO. 1, WATER DISTRICT NO. 47
RESERVOIR DECREES

Name of Reservoir	Source of Supply	Location Sec. Twp. Rge.	Decreed Date Mo. Da. Year	Amount Cu. Ft.	Remarks
RESERVOIRS DIVERTING FROM NORTH PLATTE RIVER AND TRIBUTARIES					
	BIG CREEK (left bank of North Platte River)				
Big Creek (b)	South tributary of Big Creek	9-16-11N-82W (a)	12-31-1895	300,564,000	(a) Decreed Secs. 9-10-15-16 (b) Same as Big Creek Lake
	SPRING CREEK (right bank of Big Creek) (in Wyoming)			6900 a. f.	
	SIX MILE CREEK (left bank of Spring Creek)				
Wills	Flood waters from side of mesa north, and through ½ mile of 4 inch	27-12N-81W	7- 1-1917 7- 1-1917	1,692,900 397,100*	* Provisional Decree
	THREE MILE CREEK (left bank of North Platte River)				
Hunter	Three Mile and So. Ft. Three Mile Crks.	28-12N-80W*	12-31-1914	5,963,225	* No location given in decree.
	FISCHER DRAW (left bank of North Platte River)				
P. W. Fischer	Fischer Draw and Tributaries*	28-11N-80W	10-20-1906	1,257,996	* Source not given in decree.
	MICHIGAN RIVER (right bank of North Platte River)				
	ILLINOIS RIVER (left bank of Michigan River)				
	POTTER CREEK (left bank of Illinois River)				
Case No. 1	Illinois River through Hubbard No. 2 Ditch and Waste Water*	13-24- 8N-80W	7-26-1908	5,413,593	* On tributary to Potter Creek.
Case No. 2	Illinois River through Hubbard No. 2 Ditch and Waste Water*	13-14- 8N-80W	7-27-1908	4,610,797	* On tributary to Potter Creek.
Case No. 3	Illinois River through Hubbard No. 2 Ditch and Potter Creek through Potter Ditch	15- 8N-80W	7-26-1912 7-26-1912	396,132 2,498,634*	* Provisional Decree
State Walden Reservoir and Pipe Line	Spring which is main source of supply of Potter Creek	15- 8N-80W	6-15-1925	1,653,000	For fish propagation and culture and domestic consumption only.
	WILLOW CREEK (left bank of Illinois River)				
Macfarlane	Willow and Illinois Crs. (a)	28,29-30- 7N-79W	10-20-1910	283,462,000	(a) Supplied through Macfarlane and Macfarlane Extension Ditches
	LITTLE WILLOW CREEK (left bank of Willow Creek)				
Darcy	Little Willow and Lost Creeks (b)	16- 6N-79W (a)	7- 9-1921	31,000,000	(a) Decreed Sec. 9. (b) Supplied through Darcy ditch
Darcy	Little Willow and Lost Creeks	16- 6N-79W (b)	7- 9-1921	74,469,250(a)	(a) Provisional Decree (b) Decreed Sec. 9
	EAST BRANCH WILLOW CREEK (right bank of Willow Creek)				
Lake Roslyn	Howd and Little Willow Creek through Dora or Little Dora Ditches	10- 5N-78W	9-12-1936	12,622,350*	* Provisional Decree. For propagation of fish and water fowl, bathing, swimming and boating, fishing, and other recreational uses, and domestic use.
	BADGERO CREEK (left bank of Illinois River)				
	HOWD CREEK (HOWD DRAW) (left bank of Badgero Creek)				
Lake Roslyn	(See Lake Roslyn on E. branch of Willow Creek)				
	NORTH FORK OF NORTH PLATTE RIVER (left bank of North Platte River)				
	LAKE CREEK (SCRIBNER CREEK) (left bank of North Fork of North Platte River)				
Boettcher Lake	North Fork River through Little Nellie Ditch, and Lake Creek	20-10N-81W	7- 1-1887	28,684,801	
	ROARING FORK OF NORTH PLATTE RIVER (left bank of North Platte River)				
Butte*	Roaring Fork through Wolfer Ditch or Mallon Ext. of Wolfer Ditch	2- 8N-81W and 35-36- 9N-81W	6- 1-1922	40,717,702	* Same as South and East Delaney Lakes
	JUNCTION LITTLE GRIZZLY AND BIG GRIZZLY CREEKS.				
	LITTLE GRIZZLY CREEK (left bank of North Platte River)				
	SOUTH FORK LITTLE GRIZZLY CREEK (right bank of Little Grizzly Creek)				
Gamber*	Little Grizzly Creek and Waste Water from Gamber-Brinker Ditch	21-22- 7N-81W 27-28	7-10-1925	18,142,645	* Same as Pole Mountain Lake.
	CROSBY CREEK (right bank of South Fork of Little Grizzly Creek)				
	TRIBUTARY TO CROSBY CREEK (left bank of Crosby Creek)				
Stanbaugh	Watershed Tributary to Little Grizzly Creek	4- 9- 6N-82W*	5-28-1913	1,484,820	* S. E. Records no location.
	TRIBUTARY TO CROSBY CREEK (left bank of Crosby Creek)				
Ross (a)	Melting Snow and rain and through proposed inlet ditch to be constructed from Crosby Creek	9- 6N-82W 9- 6N-82W	6-26-1911 6-26-1911	3,581,648 21,361,669*	(a) Same as Hidden Lakes * Provisional Decree
	BIG GRIZZLY CREEK (right bank of North Platte River)				
	SOAP CREEK (right bank of Big Grizzly Creek)				
Macfarlane	See Macfarlane—Willow Creek				
	BUFFALO CREEK (right bank of Big Grizzly Creek)				
	COYOTE CREEK (left bank of Buffalo Creek)				
Slack and Weiss	See Slack and Weiss, Ninegar Creek (Arapahoe Creek Basin)				
	LOST CREEK (right bank of Buffalo Creek)				
Darcy	See Darcy—Little Willow Creek				
	TRIBUTARY TO BUFFALO CREEK (right bank of Buffalo Creek)				
Clayton	Buffalo Creek	7- 6N-79W) 12- 6N-80W)	9-15-1904 9-15-1904	42,000 1,626,701*	* Provisional Decree
	TRIBUTARY TO BUFFALO CREEK (left bank of Buffalo Creek)				
Buffalo	Buffalo Creek through the Van Patten Ditch	29-30- 6N-79W	9- 1-1898	4,447,476	
	ANDERSON DRAW (COW CREEK) (left bank of Big Grizzly Creek)				
Fuller	Cow Creek	2- 6N-81W	7- 7-1906	362,949	
	MEXICAN CREEK (left bank of Big Grizzly Creek)				
	MIDDLE FORK OF MEXICAN CREEK (right bank of Mexican Creek)				
Mexican	Mexican Creek and Runoff Water	9- 6N-81W	6- 1-1915	6,696,800	
	ARAPAHOE CREEK (right bank of Big Grizzly Creek)				
	NINEGAR CREEK (right bank of Arapahoe Creek)				
Slack and Weiss	Ninegar Creek through Slack and Weiss Ditch	3- 6N-80W	6- 3-1890	350,000	

Compiled from official records of 8th Judicial District, State of Colorado.
Streams and Reservoirs listed in order of location. All locations are west of 6th Principal Meridian.

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Sheet 1 Colorado Exhibit 127

COLORADO WATER CONSERVATION BOARD—Engineering Department

CONSUMPTION OF WATER RESOURCES OF NORTH PLATTE RIVER
COLORADO - WYOMING - NEBRASKA
Averages for 1895-1939

SUMMARY	Water Consuming Area (Acres)	Unit Rate A.F. Per Acre	Exported From River Basin	Retained In Ground Storage	Consumed Incident To Irrigation	Lost In River Conveyance	Totals Exported, Retained, Lost and Consumed
BASIN TOTALS	1,098,743		27,880	145,400	899,590	546,040	1,618,910
COLORADO—TOTALS	136,648		27,880	—	89,090	27,230	144,200
JACKSON CO. (Exh. 56)	130,908		3,100	—	85,850	24,930	113,880
Exported			3,100				
IRRIGATION	115,328	0.75			85,850		
Lands	115,070	0.74			85,150		
Reservoirs	258	2.70			700		
CONVEYANCE	15,580	1.60				24,930	
Rivers-Lakes	4,866	2.70				13,140	
Bottoms	10,714	1.10				11,790	
LARIMER COUNTY	5,735		24,780		3,240	2,300	30,320
Exported			24,780				
IRRIGATION	4,050	0.80			3,240		
Lands	4,050	0.80			3,240		
Reservoirs	—	—			—		
CONVEYANCE	1,685	1.37				2,300	
Rivers-Lakes	185	2.70				500	
Bottoms	1,500	1.20				1,800	
WYOMING TOTALS	569,560		—	17,500	483,310	248,810	749,620
COLO. LINE-PATHFINDER	206,830		—	—	128,930	119,600	248,530
IRRIGATION	131,850	0.98			128,930		
Lands	125,800	0.98			113,200		
Reservoirs	6,050	2.60			15,730		
CONVEYANCE	74,980	1.66				119,600	
Rivers-Lakes	17,020	2.60				44,250	
Bottoms	57,960	1.30				75,350	
PATHFINDER - WHALEN	82,020				64,850	54,400	119,250
IRRIGATION	54,260	1.19			64,850		
Lands	51,030	1.10			56,130		
Reservoirs	3,230	2.70			8,720		
CONVEYANCE	27,760	1.96				54,400	
Rivers-Lakes	10,630	2.70				28,700	
Bottoms	17,130	1.50				25,700	
WHALEN - NEBR. LINE	280,710			17,500	289,530	74,810	381,840
GROUND STORAGE				17,500			
IRRIGATION	240,900	1.20			289,530		
Lands	229,600	1.13			260,400		
Reservoirs	11,300	2.58			29,130		
CONVEYANCE	39,810	1.88				74,810	
Rivers-Lakes	12,740	2.53				32,210	
Bottoms	27,070	1.58				42,600	
NEBRASKA TOTALS	392,540			127,900	327,190	270,000	725,090
GROUND STORAGE				127,900			
IRRIGATION	257,040	1.27			327,190		
Lands	254,900	1.26			321,200		
Reservoirs	2,140	2.80			5,990		
CONVEYANCE	135,500	1.99				270,000	
Rivers-Lakes	36,100	2.80				101,000	
Bottoms	54,700	1.70				93,000	
Sub-Lands	44,700	1.70				76,000	

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NEBR. v. WYO. and Colo.
UNITED STATES INTERVENER
COLO. EXHIBIT NO. 127
089-41-91655-1

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COLORADO WATER CONSERVATION BOARD—Engineering Department

CONSUMPTION OF WATER RESOURCES OF NORTH PLATTE RIVER
COLORADO - WYOMING - NEBRASKA
Averages for 1896-1939

WYOMING SEGREGATIONS	Water Consuming Areas (Acres)	Unit Rate A.F. Per Acre	Exported From River Basin	Retained In Ground Storage	Consumed Incident To Irrigation	Lost In River Conveyance	Totals
WHALEN to NEBR. LINE	280,710	—	—	17,500	289,530	74,810	381,840
NO. PLATTE RIVER DIRECT	52,230			17,500	53,900	17,180	88,580
TRIBUTARIES (Excl. Laramie)	41,110	—	—	—	38,520	16,830	55,350
LARAMIE BASIN							
COLO. LINE - LOOKOUT	114,010				106,100	27,800	133,900
IRRIGATION	101,320	1.05			106,100		
Lands	98,800	1.01			99,800		
Reservoirs	2,520	2.50			6,300		
CONVEYANCE	12,690	2.20				27,800	
Rivers-Lakes	9,120	2.50				22,800	
Bottoms	3,570	1.40				5,000	
LOOKOUT - FT. LARAMIE	73,260				91,010	13,000	104,010
IRRIGATION	65,950	1.38			91,010		
Lands	59,600	1.25			74,500		
Reservoirs	6,350	2.60			16,510		
CONVEYANCE	7,310	1.78				13,000	
Rivers-Lakes	1,310	2.60				3,400	
Bottoms	6000	1.60				9,600	
NEBRASKA SEGREGATIONS							
WYO. LINE to NO. PLATTE	392,540		—	127,900	327,190	270,000	725,090
NO. PLATTE RIVER DIRECT	306,240			127,900	295,640	131,900	555,440
GROUND STORAGE				127,900			
IRRIGATION	231,940	1.27			295,640		
Lands	229,800	1.26			289,650		
Reservoirs	2,140	2.80			5,990		
CONVEYANCE	64,300	2.05				131,900	
Rivers	20,600	2.80				57,600	
Bottoms	43,700	1.70				74,300	
TRIBUTARIES	96,300		—	—	31,550	138,100	169,650
IRRIGATION -	25,100	1.26			31,550		
Lands	25,100	1.26			31,550		
Reservoirs	—	—			—		
CONVEYANCE	71,200	1.94				138,100	
Rivers-Lakes	15,500	2.80				43,400	
Bottoms	11,000	1.70				18,700	
Sub-Lands	44,700	1.70				76,000	

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APPENDIX II.

Extract From Record and Exhibits.

EXTRACT FROM TESTIMONY OF ANDREW WEISS, FORMERLY NORTH PLATTE PROJECT MANAGER, COMMENCING RECORD PAGE 20,782.

Q. Now, Mr. Weiss, when the return flows are used on the river to supply the appropriators from the river, that, of course, releases water further up the stream, does it not?

A. It should, certainly.

Q. If, for instance, an appropriator on the river with a priority of, we will say, 1892, is supplied with water from the return flow from the drains, that appropriator then has no demand upon water rising further upstream, that is correct, isn't it?

A. That is correct.

Q. And when the appropriators senior to 1904 in the Scottsbluff area are supplied with water taken from the drains or from the invisible accretions in the stream, that enables the Interstate Canal and the Gering-Fort Laramie Canal to take water that might not otherwise be available for them, isn't that right?

A. Yes, sir.

Q. That was the practice, was it not, during the time that you were project engineer or project manager?

A. That was the practice insofar as it was physically possible to do so.

Q. And that was the uniform practice, was it not, while you were there, so far as the return flow waters were available in that way?

A. So far as it was within our power to do so. For instance, we diverted from the Sheep Creek into the Tri-State Canal, which was in accordance with a court decision. The river administration was in the hands of the State authorities, with whom we did not interfere.

Q. The diversion of the Sheep Creek water into the Tri-State Canal was treated by the Nebraska Department as what they called an optional diversion, was it not?

A. I am not sure how they treated that.

Q. What I mean is, the quantity which was diverted into the Tri-State Canal from Sheep Creek was deducted from the headgate diversions of the Tri-State from the river, so that the total diverted both from Sheep Creek and from the river would not exceed the amount of their appropriation, that is correct, is it not?

A. I think that is correct.

Q. And that, of course, is, in effect, an exchange of water?

A. Well, yes.

Q. So that, by using the Sheep Creek water, a portion of the North Platte river water that would otherwise be taken by the Tri-State was released for other appropriators lower down, that is correct, isn't it?

A. I presume so.

EXTRACT FROM TESTIMONY OF R. L MEEKER, RECORD, PAGES 26212 TO 26214.

Record, page 26212:

Q. Do you have any knowledge or information as to the nature of the records before 1904, as to their reliability?

A. Yes. I was an engineer and hydrographer with the Geological Survey from 1903 to 1904, in the Denver district, and in those days we had very limited funds for hydrographic work, or securing of river records. The Denver district included Wyoming, Colorado, eastern Utah and northern New Mexico, and I did make a few trips

Record, page 26213:

into Nebraska; that also, of course, included Colorado. But I know then that sometimes we only had enough money to get—where the gage rod was some distance from an observer, we used to get one reading a day, either in the morning or in the evening, instead of two readings.

And then there were other stations where the distance was so great we couldn't afford to pay the observers enough to pay to make more than a trip every other day. We didn't have the funds for travel like we have now, and we had to get along with fewer discharge measurements. Especially on high water years we might miss the deep flow and get a measurement very much less. I had occasion when I started on this work for Nebraska to study the records prior to 1904 at Guernsey, Orin Junction, and various points on the river above Guernsey,

and I found that the meter measurements were somewhat infrequent, much less than what we would like to have for good measurements; that some of the gage readings were infrequent. If I recall correctly, those readings were made only every other day, but I am not absolutely positive as to that; I know some of them were made once a day. So those records made in those earlier years, not only on the North Platte river, but all over the others, do not carry the reliability of the present-day records with automatic gages and adequate meter measurements on which to predicate or to base the discharge curves.

For that reason, I rejected all measurements prior to 1904.

Q. Were there any automatic recorders in those days?

Record, page 26214:

A. None whatever.

Q. The measurements are all based upon spot readings at an interval of a day or two days?

A. Staff day readings. I wouldn't call them spot observations; I would call them actual gage readings of insufficient frequency.

Q. And what is the value of frequent meter measurements?

A. As I stated, to be the basis of an accurate discharge curve to apply to the gage heights.

CROSS EXAMINATION BY MR. GOOD ON BEHALF OF NEBRASKA OF ELMER K. NELSON WITH REFERENCE TO WYOMING EXHIBIT 176, RECORD, PAGES 27773 TO 27787.

Record, page 27773:

Q. Mr. Nelson, you have, on Exhibit 176, what might be called an operation table of the operation of the river upon the assumptions contained in the preceding exhibits, is that correct?

A. Yes, that is correct.

Q. And, of course, that depends upon the demands which you have assumed for the areas below Pathfinder, such as 950,000 acre-feet demand, seasonal demand, May to September demand, between Whalen and Tri-State dam?

A. That is correct.

Q. And these other demands that you have further down?

A. The other demands that I have above, as to these demands of the Whalen-Tri-State dam section, are added to the demands of the Kendrick project, and that includes the supplying water below the Tri-State dam.

Q. In carrying the water down in your exhibits you carry it only down to Kingsley dam and Keystone?

A. There is a value which shows what the future run-off would be under the conditions not shown in this exhibit, at North Platte, Nebraska.

Q. You assume that the Keystone or Kingsley would take care of all the requirements below?

A. Yes.

Q. Regardless of whether they have water-rights near the Kingsley or not?

Record, page 27774:

A. That is correct.

Q. In connection with the operation of the three reservoirs—Seminoe, Pathfinder and Alcova—which you show in Exhibit 176, you make no distinction between rights of Wyoming in Pathfinder water and rights of Wyoming in Seminoe water?

A. No. This is based upon the use of the reconstructed water fund throughout. It is a water-supply study.

Q. And therefore bears no relation to the actual operation whereby some irrigators are entitled to rights from Pathfinder storage and some are not?

A. No. This is an analysis of the water supply; this is not an analysis of water-rights.

Q. And your study does not show whether this analysis of water supply could be operated practically in view of the differences in water-rights that exist below Pathfinder?

A. Oh, yes, it does; it shows there is a water supply for all.

Q. There is a water supply for all, assuming it all pooled and banded together, but it does not show what would happen if the demand were applied only to the supply available for that particular demand; it does not show what would happen under those circumstances, does it?

A. I don't understand that.

Q. Well, take, for example, some of the private canals in Wyoming below Whalen and above the State line have Warren Act contracts, and some do not. That is correct, is it not?

Record, page 27775:

A. That is correct.

Q. Those that do not have Warren Act contracts are not permitted, as a matter of practical operation, by the Wyoming authorities, to take Pathfinder storage water?

A. That is a matter of administration.

Q. That is a matter of administration, but that is also a matter that has to be taken into account in the operation of irrigation projects on the river?

A. That is a water-supply study which is based upon a determination of requirements and how those requirements can be met. This is a lawsuit between states and not between water-rights of one state and water-rights in another state.

Q. Well, let the Court decide what the suit is about, from the pleadings, but let us get an answer to this question. It is a fact, is it not, that in order to know how the river is going to be operated in the future, you have to apply the demand to the supply which is legally available to that canal, isn't that correct?

A. Yes. That is what I have done.

Q. You have assumed, however, that all these private canals in Wyoming, between Whalen and the State line, can get water from Pathfinder storage, if that is necessary?

A. If it is necessary, yes. I have made a determination of what they would have, taking water from Pathfinder storage, if they have such a right, and it is not necessary to —

Q. Your study does not show whether it is necessary or not,

Record, page 27776:

does it?

A. No; it is an analysis of water supply.

Q. And if a study should show that it was necessary, in order to give those canals the supply which your operation table gives them, then, in order to get the results which you show in Exhibit 176, you would have to give it to them, would you not?

A. Well, you know, when there is plenty of water, there is no administration required.

Q. And in connection with the Kendrick supply, you make no distinction as between the Seminoe and the Pathfinder reservoirs, as to whether the Kendrick project is getting the water from Pathfinder storage or Seminoe storage?

A. Not at all. The whole demand is placed against the water supply, together with the storage available.

Q. And, conversely, you make no distinction as to whether the Seminoe storage supply is being made available to those projects which have rights only under the Pathfinder?

A. Not at all; that is correct.

Q. You know, of course, that there are Warren Act contracts in existence for supplying Pathfinder storage water to some canals below the Tri-State dam?

A. I do not; that is, these contracts do not necessarily imply that Pathfinder water is to be supplied to them, but waters from all sources aggregating a certain amount. That is what they say.

Q. And you have even gone to the extent of cutting down some

Record, page 27777:

of those Warren Act contracts giving, for instance, the Brown's Creek Irrigation District less water than the Warren Act contract calls for?

A. I am giving it what it wants.

A. I haven't set out anyone's cut with that point in view; I have set out to determine what they want as a water supply or what is a sufficient water supply for those ditches.

Q. But the allotment that you make on the Brown's Creek is less than the Warren Act contract in evidence in this case calls for, isn't that right?

A. I think that is correct.

MR. WEHRLI: Just a moment. I object to that as placing an interpretation upon the contract. Each one of these contracts contains a restriction to beneficial use, and I rather think that your interpretation of the contract is unfounded.

Q. Now, the same thing is true, of course, with reference to the Tri-State allotment of water; the allotment of water to the Tri-State is less than the Warren Act contract calls for?

MR. WEHRLI: I object to that again, as to counsel placing a certain interpretation upon the contract. The contract very definitely states that the use under the contract shall at no

Record, page 27778:

time exceed what is required for beneficial use or such use as can be made beneficially upon the lands of the project.

A. I do not recall the conditions of that contract very well. I recall that somewhere there has been stated a certain quantity of water, which quantity as stated

is in excess of the amount of this requirement.

Q. In connection with the operation of the table which you have in Exhibit 176, there are times when the total storage shown in Column 3 is less than the capacity of the reservoir?

A. Yes, that is correct.

Q. That is true, for example, well, we will say in 1939, when, during July, August and September, the storage comes down from 966,000 in July to 667,000 at the end of September?

A. That is right.

Q. You make no distinction as to whether that water is going to be made available to the Kendrick or the Pathfinder —

A. No distinction whatever.

Q. — or to the Pathfinder users?

A. That is correct.

Q. The same condition happens from time to time throughout the last 10-year period, does it not?—in 1934, 1935, 1936, 1937, 1939 and 1940, in each of those years there are some months where the total storage of all three reservoirs togther is less than the

Record, page 27779:

Pathfinder capacity?

A. There are.

Q. Have you analyzed that water to determine whether it is Pathfinder water or Kendrick or Seminoe water?

A. No, I have not.

Q. It is possible, is it not, that due to the graphs that have been made previously by the different projects, that water all might be Pathfinder water?

A. I can't say as to that. I have made no study as to the separation of those waters.

Q. As a matter of fact, then, this operation table bears no relation to the actual rights and the actual operational uses that can be made in the operation of the river of this Pathfinder and Seminoe storage, respectively?

A. Oh, yes; full consideration has been given throughout to the satisfying of those rights.

Q. But not to the question of what those rights apply to—not to the question of whether the water can legally be furnished to those rights; that question has not been brought into your picture at all?

A. No; the water supply is there to be furnished to all the rights.

Q. That is, you are assuming that that Pathfinder water, as run out of the Seminoe water, can legally be used on the Interstate Canal, is that right?

Record, page 27780:

A. I have stated heretofore that all this water fund has been pooled in connection with the reservoir system at Pathfinder, which is now constructed and in operation, —

Q. And then you assume —

A. I beg your pardon. I am not quite finished — and that under those conditions, with all the projects in operation, which takes into account the return flows of Kendrick project, and other accretions, the rights will be fully satisfied, and that the period could have met the requirements or demand for water throughout.

Q. You have assumed, then, that the Kendrick project can use Pathfinder storage water after the Seminoe has been emptied, when there is no more Seminoe water left?

A. I have said several times, Mr. Good, I have made no such assumptions whatever.

Q. That is necessarily involved in your theory of pooling the water, is it not?

A. Not necessarily.

Q. Will you explain to me where, in this study, you show that the thing can be operated without the Kendrick using the Pathfinder water?

A. I haven't said that it could and I haven't said it could not. I have said that I haven't made such a determination.

Q. I notice, Mr. Nelson, that at the end of September, 1940, you show a total storage content of all three reservoirs of 169,000 acre-feet.

Record, page 27781:

A. That is correct.

Q. If the demands were increased by ten per cent, the whole reservoir system would be emptied during the summer of 1940, would it not?

A. Well, that would depend upon other factors. For example, as is customary in studies of this kind, the calculations assume uniformity in requirements, taking supplies as they come. However, there are times throughout these periods, like the 1931-1940 period, when — for example, on the Whalen-Tri-State dam section, perhaps even on other projects as well, they got the demands that are shown here, that it would not have been necessary to release. But this is a customary procedure. I have made no other determination from it, excepting I wanted to find out that there would be, as there usually are, years when that amount of water does not need to

be released, so that the rights will secure all the water they want, together with precipitation and other local supplies.

Q. Now, the last spill which you show is on Sheet 16, for the month of June, 1933?

A. That is correct.

Q. So that for the succeeding seven years, all the water supply that comes in is used under your operational table by the demands that are applied against it, and still you have 169,000 acre-feet left at the end of the period?

A. That is correct.

Q. If the 1934 demand were increased by ten per cent, that

Record, page 27782:

would be 4,000 acre-feet more water used, would it not?

A. You mean the demand out of Pathfinder for Whalen-Tri-State dam section?

Q. Yes.

A. Yes, ten per cent of that value would be four thousand.

Q. And leaving out altogether the Kendrick demand, let us take just the demand Whalen-Tri-State dam section, and add ten per cent each year, and you would run out of water in 1939, would you not?

A. Yes, I think that is probably correct.

Q. And even adding five per cent, you would run out of water before 1940, would you not?

A. Yes, that is correct.

Q. From 1917 to 1930, Exhibit 176 shows total spills of a little over seven million acre-feet, does it not?

A. I haven't added those.

Q. Well, that is about right, is it not?

A. I don't know. I have no way of knowing. I have never made the addition.

Q. That would be about 502,000 acre-feet per year, if it were seven million —

A. Now, let me see. Your period is —

Q. 1917 to 1930.

A. If you have added it correctly and divided it correctly, I presume that is the amount.

Q. What does your plan of operation undertake to do with that

Record, page 27783:

500,000 acre-feet per year which apparently is uncontrolled waters?

A. The plan of operation here only takes into account the controlled water supplies. I have taken that into no account whatever. I have indicated on later exhibits what, on the average, those spills would amount to when they reach the Kingsley reservoir.

Q. Have you taken into account the fact that by allowing a higher demand for the Whalen-Tri-State dam area, all that water could be utilized?

A. Well, I have stated heretofore that any such water, as well as excess waters, originating below Alcova, can be used to any extent they want to use it. In my opinion, that would not result in any way in the amount of water ultimately, under present conditions, reaching Kingsley reservoir, but it might be a good thing if you would divert some of this excess so that some of it would turn into return flows and have a better distribution by the time it got down

to Kingsley, and have the better part of it usable for that reason.

Q. As a matter of fact, you have cut down the demand and eliminated all the demand below the Tri-State dam in order to arrive at this 169,000 acre-feet storage contents in September of 1940, isn't that a fact?

A. That is untrue, absolutely.

Q. It is only by reason of this drastically reduced demand that your operation table shows storage contents in these reservoirs at all times?

A. The true demand has not been reduced in any respect. The

Record, page 27784:

full supply is available under these conditions of Kingsley reservoir. The requirement, used as demand, was worked out, and the study was begun in the Whalen-Tri-State dam section. It was taken here and worked backwards. If that is what you mean, that is exactly the situation. I have reduced no demand; I have computed and allowed for full requirement in this area.

Q. That is what your opinion is of full requirement? That is what you mean, is it not?

A. Exactly, it is my opinion.

Q. And not the requirement that past experience shows was imposed?

A. I haven't seen any past experience that indicates the requirement from which these data have been prepared.

Q. Exhibit 176 gives to the Kendrick project, priority of 1931, the full supply of water during the full 37-year period?

A. You say that the Seminoe reservoir has a priority of 1931?

Q. For the priority of 1931 it gives the full requirement throughout the entire 37-year period?

A. Exactly.

Q. And the Interstate Canal, with a priority of 1904, gets less than the average of what it got during the 1931 to 1940 period? That is correct, is it not?

A. I think they got about the same.

Q. Well, for the May-September period it got less, but with the winter water which you allow here, it gets practically the same, does

Record, page 27785:

it not?

A. About the same, yes, that is correct.

Q. And that in spite of the fact that during the 1931 to 1940 period there were at least two years when the lands under the Interstate Canal got less than .6 per acre?

A. I think that is what you read from the record yesterday.

Q. In spite of that, you gave the Kendrick project a full supply of water?

A. I have shown that it was available for them.

Q. Any spills which your operation table shows come during the May and June period, do they not?

A. I haven't examined them for that purpose. I presume they do. They usually would come in May and June. The greatest spills ordinarily would occur in June.

Q. Except in the year 1917 you have no year when you show any spill for later than June?

A. Yes; in 1907 there is a spill in July - -

Q. That is exceptional, however, is it not?

A. - - and in 1917. Yes, that is exceptional, as indicated on another exhibit.

Q. The period when those spills come is not the period when the projects in the Whalen to Keystone area are in real need of water or have been getting short, is it? The period is in the early season when usually there is a pretty fair supply for the projects below Whalen?.

Record, page 27786:

A. Yes. For that reason they would not need to use anything but spills; they wouldn't have to make a draft on the storage, as a matter of fact, and any adjustment of that kind is allowed for in a study such as this.

Q. These spills come at a time when they would not be useful for these projects that you have cut down to your low water requirement, isn't that right?

A. Well, the usable water - - whenever they have any need of any up-river water, they would always use it.

Q. I say, these spills come at a time usually when they are not demanding water beyond the normal fund?

A. I think that is generally true, that that would happen in a reservoir system, and it is for that reason that we build storage, and it is for that reason that we are able to deplete the runoff above Pathfinder to the extent that we have; that is, the water generally that is used is water which would be spilled water anyway if it were not used. I think that statement is true; I think spills as a general rule, throughout the system are waste waters and not controlled by storage.

Q. And these spills as you have put them here create a waste where, in an operation which would permit them to be held back until July and August, they would be conserved?

A. Yes. That kind of an operation is proposed by the Seminoe reservoir and the Kendrick project.

Q. But your operation table shows that that is not successful

Record, page 27787:

during large periods with the average of 500,000 acre-feet spill 1917 to 1930?

A. The storage capacity is not sufficient to control all the runoff at Pathfinder; even with your runoff adjusted, it is still inadequate.

Q. Have you compared this operation with the actual historical spills that were made when the Pathfinder alone was used?

A. There are no historical spills.

Q. You mean that - -

A. There is no record of historical spills at all.

Q. You mean, when Pathfinder alone is in operation, it never spills?

A. Yes, it did spill, but a spill is the amount of water which would flow over the spillway of a dam, provided that the release from the gates were cut down to the amount required for uses below. The gates have a capacity several times greater than the amount required for actual operation of discharge, and therefore the spill is the sum of two valves in the reservoir - - the excess that is charged to the gates, plus the amount that went over the spillway - - and I say we have no record of that.

Q. Well, it is a fact, is it not - -

A. Unless a comparison is made with these values here, which include the three reservoir studies, with the amount of water being Pathfinder storage. You might determine some sort of a spill in that case.

PART OF SHEET 1, NEBRASKA EXHIBIT 6

NORTH PLATTE RIVER INFLOW PATHFINDER RESERVOIR, WYOMING

Values in Acre-feet

	1931	1932	1933
October	64,400	31,200	32,400
November	31,400	25,300	36,300
December	28,600	19,400	22,600
January	18,600	20,100	22,000
February	23,300	20,100	18,800
March	40,300	44,300	50,200
April	119,000	235,000	98,900
May	147,000	456,000	222,000
June	171,000	435,000	513,000
July	25,800	163,000	77,300
August	20,100	42,000	25,000
September	16,800	15,200	31,000
Totals	706,300	1,506,600	1,149,500

PART OF SHEET 1, NEBRASKA EXHIBIT 7

NORTH PLATTE RIVER AT PATHFINDER DAM, WYOMING
REGULATED OUTFLOW FROM PATHFINDER RESERVOIR

Values in Acre-feet

	1931	1932	1933
October	12,000	31,200	18,700
November	12,300	4,610	4,600
December	7,190	2,180	3,690
January	6,270	2,150	3,070
February	2,740	2,010	3,350
March	3,070	941	1,080
April	2,560	0	790
May	121,000	65,200	0
June	317,000	336,000	314,000
July	296,000	376,000	344,000
August	197,000	280,000	303,000
September	26,800	211,000	152,000
Totals	1,003,930	1,311,000	1,148,280

PART OF NEBRASKA EXHIBIT 611

1930 - 1940

WATER ENTERING NEBRASKA VIA INTERSTATE CANAL

Records of Pathfinder Irrigation District

Measured at Mile 50.8 (Near State Line) 2 Small Laterals Not Included
Staff Gage Readings; Infrequent Meter Measurements
Values in Acre-Feet
Records 1930 to 1937 Furnished by C. F. Gleason, Engineer U. S. Bureau Reclamation
Records 1938 to 1940 Furnished by T. W. Parry, Manager Pathfinder Irrigation Dist.
R. I. Meeker, Engineer

Year	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Totals
1930	17,910	39,590	75,770	95,640	81,860	58,400	4,030	.....	373,200
1931	9,530	60,130	90,530	75,430	74,780	5,090	15,760	19,200	350,450
1932	25,230	55,440	73,600	94,400	57,030	85,550	46,980	370	438,600
1933	13,310	43,470	83,590	95,060	95,180	68,540	22,580	.....	421,730
1934	9,700	22,470	21,420	20,210	34,680	.....	.....	.....	108,480
1935	.....	13,260	43,550	80,760	75,990	17,150	.....	.....	230,710
1936	23,060	68,170	53,910	62,090	61,240	16,090	.....	.....	284,560
1937	12,120	50,510	58,010	81,210	91,440	67,630	3,960	.....	364,880
1938	16,160	49,110	57,690	71,400	92,380	58,840	7,780	.....	353,360
1939	9,050	69,900	49,900	62,380	65,380	26,380	.....	.....	282,990
1940	.....	34,490	20,860	35,340	51,580	.....	.....	.....	142,270

PART OF WYOMING EXHIBIT 180

(a) 128.6 M. Acre Feet, Undivertible, included. Data from Stream Flow and Diversion Records.

WYOMING EXHIBIT NO. 180

Elmer K. Nelson, C. E.

1941

NORTH PLATTE RIVER

WATER PASSING TRI-STATE DAM — HISTORICAL.

1931-1940

Thousands Acre Feet

	May	June	July	Aug.	Sept.	Total
1931	16.3	22.0	7.5	10.8	2.0	58.6
1932	27.7	36.6	53.0	22.8	5.8	145.9
1933	(a) 146.0	51.6	44.5	24.6	18.8	285.5
1934	4.4	5.4	3.0	2.2	1.1	16.1
1935	23.6	71.5	7.2	9.0	1.6	112.9
1936	13.2	24.4	14.4	4.1	3.3	59.4
1937	11.1	31.4	48.9	6.0	1.4	98.8
1938	37.5	16.2	14.1	9.9	17.0	94.7
1939	12.9	10.1	10.5	6.4	1.1	41.0
1940	9.0	14.0	5.1	2.7	1.6	32.4
Means,	30.1	28.3	20.8	9.9	5.4	94.5
Undivertible (a)	12.8					12.8
Divertible Passing	17.3	28.3	20.8	9.9	5.4	81.7

PART OF U. S. EXHIBIT 204 D, 1939 U. S. CENSUS REPORT

From Pages 24, 25, Lines 18, 22

IRRIGATED AREAS MORRILL AND SCOTTS BLUFF COUNTIES, NEBRASKA

	1929	1939
Morrill	87,306 acres	79,962 acres
Scotts Bluff	193,816 acres	200,468 acres
Totals	281,122 acres	280,430 acres

PART OF COLUMN 34, SHEET 1, U. S. EXHIBIT 273

NET GAIN OR LOSS PATHFINDER TO GUERNSEY MAY TO SEPTEMBER, 1933

May	187,000 acre-feet
June	10,200 acre-feet
July	-5,300 acre-feet
August	10,200 acre-feet
September	11,300 acre-feet

IN THE

Supreme Court of the United States

No. 6 Original

THE STATE OF NEBRASKA,
Complainant,

vs.

THE STATE OF WYOMING,
Defendant,

THE STATE OF COLORADO,
Impleaded Defendant,

UNITED STATES OF AMERICA,
Intervener.

APPENDIX TO WYOMING BRIEF

DATA FROM ENGINEERS' STIPULATION, PAGES 5 and 6, CONCERNING RESERVOIRS.

Seminoe Reservoir

Capacity.....1,026,000 acre feet
Operation commenced April 1939 (Nebr. Ex. 602)

Pathfinder Reservoir

Capacity.....1,045,000 acre feet
Operation commenced April 1909 (Colo. Ex. 99)

Alcova Reservoir

Capacity.....190,000 acre feet
Operations commenced Feb. 1938 (Nebr. Ex. 602)

WYOMING EXHIBIT NO. 176
Elmer K. Nelson, C. E.
1941

Sheet 1

NORTH PLATTE RIVER IRRIGATION DEMANDS

ANALYSIS OF RUN-OFF ADJUSTED TO FUTURE USES, WITH STORAGE IN SEMINOE, PATHFINDER AND ALCOVA RESERVOIRS.

Notes on Wyoming Exhibit No. 176

Col. 1 Wyoming Exhibit 100 adjusted to future development above Pathfinder Reservoir. Adjustments of previous exhibit.

Col. 2 Storage in Reservoirs at beginning of month or period.

Col. 3 Storage in Reservoirs at end of month or period.

Col. 4 Required Discharges at Reservoirs, sum of values in Cols. 7 and 8.

Col. 5 Computed Reservoir Evaporation losses. For 1904-1913; Data from Colo. Ex. 78; Pathfinder station mean adjusted with relation to Ft. Collins, Colo. station. Monthly distribution average. For 1914-1940; Pathfinder station evaporation records applied to mean monthly water surface of Reservoirs. See Colo. Ex. 78 or Nebr. Exs.

Col. 6 Spills based upon a total storage in Reservoirs as follows:

Seminoe	1,024.0
Pathfinder	1,045.0
Alcova	180.0 mean,
Total	2,249.0 M. Ac. Ft.

When Storage declines to 160.0, Kendrick Project cannot divert water.

Col. 7 Demand for Kendrick Project. Previous Exhibit.

Col. 8 Demand at the Whalen—Tri-State Dam Section upon runoff originating above Pathfinder. Col. B, companion exhibit.

Note: Private Ditches on River between Pathfinder and Guernsey assumed in statuo quo. Run-off values are net with such uses in operation.

WYOMING EXHIBIT NO. 176

Sheet 2

NORTH PLATTE RIVER
IRRIGATION DEMANDS

ANALYSIS OF RUN-OFF ADJUSTED TO FUTURE USES, WITH STORAGE IN SEMINOE, PATHFINDER AND ALCOVA RESERVOIRS

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res. Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1904				
Oct.-Apr.	365.0	.0	355.0	10.0	.0	.0	.0	.0
May	328.5	355.0	581.5	98.9	3.1	.0	24.0	74.9
June	326.0	581.5	811.8	89.4	6.3	.0	36.0	53.4
July	47.0	811.8	636.6	215.0	7.2	.0	51.0	164.0
Aug.	22.3	636.6	437.1	216.7	5.1	.0	33.0	183.7
Sept.	80.2	437.1	352.0	112.0	3.3	.0	24.0	88.0
May-Sept.	754.0			732.0	25.0	.0	168.0	564.0
Year	1119.0			742.0				
				1905				
Oct.-Apr.	247.0	352.0	589.9	10.0	.0	.0	.0	.0
May	229.5	589.9	791.1	24.0	4.3	.0	24.0	.0
June	449.0	791.1	1095.8	136.3	8.0	.0	36.0	100.3
July	46.0	1095.8	947.1	185.0	9.7	.0	51.6	134.0	
Aug.	23.2	947.1	765.3	197.6	7.4	.0	33.0	164.6
Sept.	21.8	765.3	671.9	109.9	6.3	.0	24.0	85.9
May-Sept.	769.5			652.8	34.7	.0	168.0	484.8
Year	1017.4			662.8				

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WYOMING EXHIBIT NO. 176

Sheet 3

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1906				
Oct.-Apr.	349.5	671.9	1011.4	10.0	.0	.0	.0	.0
May	346.5	1011.4	1266.4	84.9	6.6	.0	24.0	60.9
June	365.0	1266.4	1478.0	146.9	6.5	.0	36.0	110.9
July	75.0	1478.0	1346.6	199.0	7.4	.0	51.0	148.0
Aug.	27.5	1346.6	1180.7	182.9	10.5	.0	33.0	149.9
Sept.	46.5	1180.7	1101.8	117.3	8.1	.0	24.0	93.3
May-Sept.	860.5			731.0	39.1	.0	168.0	563.0
Year	1210.0			741.0				
				1907				
Oct.-Apr.	474.4	1101.8	1566.2	10.0	.0	.0	.0	.0
May	276.4	1566.2	1804.5	26.9	11.2	.0	24.0	2.9
June	525.5	1804.5	2246.9	63.9	19.2	.0	36.0	27.9
July	290.7	2246.9	2249.0	184.0	24.6	80.0	51.0	133.0
Aug.	67.2	2249.0	2099.7	195.7	20.8	.0	33.0	162.7
Sept.	44.1	2099.7	2036.1	93.6	14.1	.0	24.0	69.6
May-Sept	1203.9			564.1	89.9	80.0	168.0	396.1
Year	1678.3			574.1				

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WYOMING EXHIBIT NO. 176

Sheet 4

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1908				
Oct-April	317.1	2036.1	2249.0	10.0	.0	94.2	.0	.0
May	116.6	2249.0	2249.0	24.0	13.4	79.2	24.0	.0
June	213.5	2249.0	2249.0	36.0	19.7	157.8	36.0	.0
July	77.3	2249.0	2041.9	263.0	21.4	.0	51.0	212.0
Aug.	65.0	2041.9	1865.3	228.6	13.0	.0	33.0	195.6
Sept.	37.3	1865.3	1775.7	115.4	11.5	.0	24.0	91.4
May-Sept.	509.7			667.0	79.0	237.0	168.0	499.0
Year	826.8			677.0		331.2		
				1909				
Oct.-April	356.6	1775.7	2122.3	10.0	.0	.0	.0	.0
May	416.4	2122.3	2249.0	66.9	12.5	210.3	24.0	42.9
June	934.5	2249.0	2249.0	69.9	18.3	846.3	36.0	33.9
July	327.7	2249.0	2233.3	324.0	19.4	.0	51.0	273.0
Aug.	86.4	2233.3	2070.2	231.9	17.6	.0	33.0	198.9
Sept.	80.0	2070.2	2013.7	122.8	13.7	.0	24.0	98.8
May-Sept	1845.0			815.5	81.5	1056.6	168.0	647.5
Year	2201.6			825.5				

WYOMING EXHIBIT NO. 176

Sheet 5

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7. Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1910				
Oct.-Apr.	445.1	2013.7	2249.0	10.0	.0	209.8	.0	.0
May	225.6	2249.0	2249.0	89.9	13.0	122.7	24.0	65.9
June	138.5	2249.0	2099.7	264.9	22.9	.0	36.0	228.9
July	14.5	2099.7	1810.4	281.0	22.8	.0	51.0	230.0
Aug.	16.5	1810.4	1537.0	235.9	18.0	.0	33.0	202.9
Sept.	27.2	1573.0	1467.8	120.8	11.6	.0	24.0	96.0
May-Sept.	422.3			992.5	88.3	122.7	168.0	824.5
Year	877.4			1002.5		332.5		
				1911				
Oct.-Apr...	345.1	1467.8	1802.9	10.0	.0	.0	.0	.0
May	236.5	1802.9	1940.8	84.0	14.6	.0	24.0	60.0
June	338.0	1940.8	2018.4	237.0	22.5	.0	36.0	201.9
July	21.9	2018.4	1735.1	281.0	24.2	.0	51.0	230.0
Aug.	15.7	1735.1	1503.5	225.9	21.4	.0	33.0	192.9
Sept.	26.8	1503.5	1400.8	115.8	13.7	.0	24.0	91.8
May-Sept.	638.9			944.6	96.4	.0	168.0	776.6
Year	984.0			954.6				

WYOMING EXHIBIT NO. 176

Sheet 6

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tr.-State Dam
1912								
Oct.-Apr.	392.3	1400.8	1783.1	10.0	.0	.0	.0	.0
May	343.4	1783.1	2089.4	24.0	13.1	.0	24.0	.0
June	550.5	2089.4	2249.0	243.9	22.4	124.6	36.0	207.9
July	197.7	2249.0	2111.7	310.0	25.0	.0	51.0	259.0
Aug.	96.4	2111.7	1945.6	241.9	20.6	.0	33.0	208.9
Sept.	82.4	1945.6	1898.0	115.8	14.2	.0	24.0	91.8
May-Sept.	1270.4			935.6	95.3	124.6	168.0	767.6
Year	1662.7			945.6				
1913								
Oct.-Apr.	618.5	1898.0	2249.0	10.0	.0	257.5	.0	.0
May	294.5	2249.0	2249.0	98.9	14.8	180.8	24.0	74.9
June	190.0	2249.0	2169.0	248.9	21.1	.0	36.0	212.9
July	3.3	2169.0	1868.2	282.0	22.1	.0	51.0	251.0
Aug.	19.6	1868.2	1636.0	234.9	16.9	.0	33.0	201.9
Sept.	30.4	1636.0	1542.1	112.8	11.5	.0	24.0	88.8
May-Sept.	537.8			977.5	86.4	180.8	168.0	809.5
Year	1156.3			987.5		438.3		

WYOMING EXHIBIT NO. 176

Sheet 7

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1914				
Oct.-Apr.	429.2	1542.1	1961.3	10.0	.0	.0	.0	.0
May	415.5	1961.3	2249.0	49.9	19.6	58.3	24.0	25.9
June	456.0	2249.0	2249.0	256.9	26.8	172.3	36.0	220.9
July	50.0	2249.0	1978.6	291.0	29.4	.0	51.0	240.0
Aug.	47.6	1978.6	1763.8	283.9	23.5	.0	33.0	205.9
Sept.	36.6	1763.8	1660.0	122.8	17.6	.0	24.0	98.8
May-Sept.	1005.7			959.5	116.9	230.6	168.0	791.5
Year	1434.9			969.5				
				1915				
Oct.-Apr	343.4	1660.0	1993.4	10.0	.0	.0	.0	.0
May	144.6	1993.4	2083.2	40.6	14.2	.0	24.0	16.6
June	197.5	2083.2	2068.0	192.9	19.8	.0	36.0	156.9
July	36.7	2068.0	1803.4	279.0	22.3	.0	51.0	228.0
Aug.	40.7	1803.4	1618.4	207.9	17.8	.0	33.0	174.9
Sept.	59.1	1618.4	1625.3	39.8	12.4	.0	24.0	15.8
May-Sept.	478.6			760.2	86.5	.0	168.0	592.2
Year	822.0			770.2				

WYOMING EXHIBIT NO. 176

Sheet 8

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Runoff	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.°	8 Demand Whalen to Tri-State Dam
				1916				
Oct.-Apr...	455.9	1625.3	2071.2	10.0	.0	.0	.0	.0
May	268.5	2071.2	2232.8	91.9	15.0	.0	24.0	67.9
June	268.0	2232.8	2215.5	258.9	26.4	.0	36.0	222.9
July	53.0	2215.5	1950.2	288.0	30.3	.0	51.0	237.0
Aug.	43.5	1950.2	1754.0	217.9	21.8	.0	33.0	184.9
Sept.	45.1	1754.0	1671.1	109.8	18.2	.0	24.0	85.8
May-Sept.	678.1			966.5	111.7	.0	168.0	798.5
Year 1134.0				976.5				
				1917				
Oct.-Apr.	504.2	1671.1	2165.3	10.0	.0	.0	.0	.0
May	423.4	2165.3	2249.0	24.0	17.4	298.3	24.0	.0
June	821.5	2249.0	2249.0	128.9	24.2	668.4	36.0	92.9
July	387.7	2249.0	2249.0	223.0	32.2	132.5	51.0	172.0
Aug.	67.5	2249.0	2068.0	221.9	26.6	.0	33.0	188.9
Sept.	57.3	2068.0	2005.0	102.8	17.5	.0	24.0	78.8
May-Sept.	1757.4			700.6	117.9	1099.2	168.0	532.6
Year 2261.6				710.6				

Sheet 9

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res. Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1918				
Oct.-Apr.	405.0	2005.0	2249.0	10.0	.0	151.0	.0	.0
May	304.5	2249.0	2249.0	24.0	17.9	262.6	24.0	.0
June	547.0	2249.0	2249.0	198.0	24.2	323.9	36.0	162.9
July	74.0	2249.0	2093.0	205.0	25.0	.0	51.0	154.0
Aug.	26.7	2093.0	1928.7	165.9	25.1	.0	33.0	132.9
Sept.	39.2	1928.7	1893.0	60.8	14.1	.0	24.0	36.8
May-Sept.	991.4			654.6	106.3	586.5	168.0	486.6
Year	1396.4			664.6		737.5		
				1919				
Oct.-Apr.	386.9	1893.0	2249.0	10.0	.0	20.9	.0	.0
May	224.6	2249.0	2249.0	129.9	23.7	91.0	24.0	105.9
June	143.5	2249.0	2117.8	247.9	26.8	.0	36.0	211.9
July	15.0	2117.8	1831.0	273.0	28.8	.0	51.0	222.0
Aug.	15.0	1831.0	1608.1	216.9	21.0	.0	33.0	183.9
Sept.	16.4	1608.1	1492.5	119.8	12.2	.0	24.0	95.8
May-Sept.	434.5			987.5	112.5	91.0	168.0	819.5
Year	821.4			997.5		119.9		

WYOMING EXHIBIT NO. 176

Sheet 10

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
1920								
Oct.-Apr.	387.0	1492.5	1869.5	10.0	.0	.0	.0	.0
May	542.4	1869.5	2249.0	24.0	9.6	129.3	24.0	.0
June	594.5	2249.0	2249.0	253.9	23.0	317.6	36.0	217.9
July	104.7	2249.0	2080.9	247.0	25.8	.0	51.0	196.0
Aug.	55.0	2080.9	1907.9	208.9	19.1	.0	33.0	175.9
Sept.	46.3	1907.9	1859.3	79.8	15.1	.0	24.0	55.8
May-Sept.	1342.9			813.6	92.6	446.9	168.0	645.6
Year	1729.9			823.6				
1921								
Oct.-Apr.	406.6	1859.3	2249.0	10.0	.0	6.9	.0	.0
May	366.4	2249.0	2249.0	36.9	16.5	313.0	24.0	12.9
June	689.5	2249.0	2249.0	277.9	23.7	387.9	36.0	241.9
July	98.7	2249.0	2055.9	267.0	24.8	.0	51.0	216.0
Aug.	67.9	2055.9	1881.1	223.9	18.8	.0	33.0	190.9
Sept.	39.4	1881.1	1783.6	120.8	16.1	.0	24.0	96.8
May-Sept.	1261.9			926.5	99.9	700.9	168.0	758.5
Year	1668.5			936.5		707.8		

Sheet 11

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1922				
Oct.-Apr.	371.4	1783.5	2145.0	10.0	.0	.0	.0	.0
May	317.5	2145.0	2249.0	29.9	16.5	167.1	24.0	5.9
June	337.0	2249.0	2249.0	233.9	24.2	78.9	36.0	197.9
July	14.6	2249.0	1955.4	284.0	24.2	.0	51.0	233.0
Aug.	14.0	1955.4	1723.8	224.9	20.7	.0	33.0	191.9
Sept.	17.0	1723.8	1618.9	106.8	15.1	.0	24.0	82.8
May-Sept.	700.1			879.5	100.7	246.0	168.0	711.5
Year	1071.5			889.5				
				1923				
Oct.-Apr.	326.4	1618.9	1935.3	10.0	.0	.0	.0	.0
May	347.5	1935.3	2243.8	24.0	15.0	.0	24.0	.0
June	492.0	2243.8	2249.0	209.9	25.0	251.9	36.0	173.9
July	153.0	2249.0	2130.3	252.0	19.7	.0	51.0	201.0
Aug.	41.0	2130.3	1944.4	201.9	25.0	.0	33.0	168.9
Sept.	54.9	1944.4	1938.3	45.8	15.2	.0	24.0	21.8
May-Sept.	1088.4			733.6	99.9	251.9	168.0	565.6
Year	1414.8			743.6				

WYOMING EXHIBIT NO. 176

Sheet 12

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1924				
Oct.-Apr.	648.7	1938.3	2249.0	10.0	.0	328.0	.0	.0
May	337.5	2249.0	2249.0	24.0	13.0	300.5	24.0	.0
June	349.0	2249.0	2249.0	223.9	25.0	100.1	36.0	187.9
July	37.5	2249.0	1956.5	304.0	26.0	.0	51.0	253.0
Aug.	15.7	1956.5	1693.5	261.9	16.8	.0	33.0	228.9
Sept.	17.5	1693.5	1603.2	98.8	9.0	.0	24.0	74.8
May-Sept.	757.2			912.6	89.8	400.6	168.0	744.6
Year	1405.9			922.6		728.6		
				1925				
Oct.-Apr.	470.5	1603.2	2063.7	10.0	.0	.0	.0	.0
May	237.5	2063.7	2212.3	71.9	17.0	.0	24.0	47.9
June	259.0	2212.3	2218.3	231.9	21.1	.0	36.0	195.9
July	84.0	2218.3	1980.1	298.0	24.2	.0	51.0	247.0
Aug.	49.2	1980.1	1774.0	235.9	19.4	.0	33.0	202.9
Sept.	62.5	1774.0	1731.2	92.8	12.5	.0	24.0	68.8
May-Sept.	692.2			930.5	94.2	.0	168.0	762.5
Year	1162.7			940.5				

Sheet 13

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res. Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1928				
Oct.-Apr.	693.6	1731.2	2249.0	10.0	.0	165.8	.0	.0
May	419.4	2249.0	2249.0	54.9	17.9	346.6	24.0	30.9
June	339.5	2249.0	2249.0	233.9	21.5	84.1	36.0	197.9
July	123.7	2249.0	2073.7	277.0	22.0	.0	51.0	226.0
Aug.	50.6	2073.7	1852.4	249.9	22.0	.0	33.0	216.9
Sept.	35.9	1852.4	1762.8	112.8	12.7	.0	24.0	88.8
May-Sept.	969.1			928.5	96.1	430.7	168.0	760.5
Year	1662.7			938.5		596.5		
				1927				
Oct.-Apr.	405.4	1762.8	2158.2	10.0	.0	/.0	.0	.0
May	410.5	2158.2	2249.0	24.0	19.7	276.0	24.0	.0
June	364.0	2249.0	2249.0	244.9	21.0	98.1	36.0	208.9
July	89.0	2249.0	2020.9	293.0	24.1	.0	51.0	242.0
Aug.	67.6	2020.9	1853.2	217.9	17.4	.0	33.0	184.9
Sept.	53.0	1853.2	1794.9	97.8	13.5	.0	24.0	73.8
May-Sept.	984.1			877.6	95.7	374.1	168.0	709.6
Year	1389.5			887.6				

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Sheet 14

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
1928								
Oct.-Apr.	514.1	1794.9	2249.0	10.0	.0	50.0	.0	.0
May	547.4	2249.0	2249.0	42.0	14.7	490.7	24.0	18.0
June	382.5	2249.0	2249.0	169.9	17.4	195.2	36.0	133.9
July	85.7	2249.0	2041.8	272.5	20.4	.0	51.0	221.5
Aug.	47.3	2041.8	1834.1	233.8	21.8	.0	33.0	200.8
Sept.	38.6	1834.1	1755.2	105.3	12.2	.0	24.0	81.3
May-Sept.	1101.5			823.5	85.9	685.9	168.0	655.5
Year	1615.6			833.5		735.9		
1929								
Oct.-Apr.	539.9	1755.2	2249.0	10.0	.0	36.1	.0	.0
May	446.4	2249.0	2249.0	24.0	17.0	405.4	24.0	.0
June	537.5	2249.0	2249.0	175.4	22.8	339.3	36.0	139.4
July	144.7	2249.0	2071.9	296.4	25.4	.0	51.0	245.4
Aug.	58.7	2071.9	1872.2	237.0	21.4	.0	33.0	204.0
Sept.	78.0	1872.2	1832.9	109.6	7.7	.0	24.0	85.6
May-Sept.	1265.3			842.4	94.3	744.7	168.0	674.4
Year	1805.2			852.4		780.8		

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Sheet 15

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res. Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1930				
Oct.-Apr.	541.1	1832.9	2249.0	10.0	0.	115.0	.0	.0
May	169.5	2249.0	2249.0	63.8	14.7	91.0	24.0	39.8
June	174.0	2249.0	2133.5	266.5	23.0	.0	36.0	230.5
July	7.0	2133.5	1826.8	289.2	24.5	.0	51.0	238.2
Aug.	82.0	1826.8	1701.0	193.7	14.1	.0	33.0	160.7
Sept.	35.5	1701.0	1632.6	93.2	10.7	.0	24.0	69.2
May-Sept.	468.0			906.4	87.0	91.0	168.0	738.5
Year	1009.1			916.4		206.0		
				1931				
Oct.-Apr.	363.6	1632.6	1986.2	10.0	.0	.0	.0	.0
May	139.6	1986.2	2002.3	108.0	15.5	.0	24.0	84.0
June	139.5	2002.3	1887.0	232.8	22.0	.0	36.0	196.8
July	15.0	1887.0	1602.7	273.9	25.4	.0	51.0	222.9
Aug.	15.0	1602.7	1413.2	187.2	17.3	.0	33.0	154.2
Sept.	21.7	1413.2	1316.3	103.7	14.9	.0	24.0	79.7
May-Sept.	330.8			905.5	95.1	.0	168.0	737.5
Year	694.4			915.5				

WYOMING EXHIBIT NO. 176

Sheet 16

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res. Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
1932								
Oct.-Apr.	422.0	1316.3	1728.3	10.0	.0	.0	.0	.0
May	445.5	1728.3	2113.2	47.1	13.5	.0	24.0	23.1
June	390.0	2113.2	2218.8	262.4	22.0	.0	36.0	226.4
July	112.0	2218.8	2002.5	297.6	30.7	.0	51.0	246.6
Aug.	28.5	2002.5	1782.5	223.5	25.0	.0	33.0	190.5
Sept.	22.2	1782.5	1684.9	104.2	15.6	.0	24.0	80.2
May-Sept.	998.2			934.7	106.8	.0	168.0	766.7
Year	1420.2			944.7				
1933								
Oct.-Apr.	319.2	1684.9	1994.1	16.0	.0	.0	.0	.0
May	211.5	1994.1	2165.8	24.0	15.8	.0	24.0	.0
June	468.0	2165.8	2249.0	257.9	30.8	96.1	36.0	221.9
July	26.3	2249.0	1964.0	279.8	31.5	.0	51.0	228.8
Aug.	11.5	1964.0	1748.2	206.9	20.4	.0	33.0	173.9
Sept.	38.0	1748.2	1673.4	94.2	18.6	.0	24.0	70.2
May-Sept.	755.3			862.8	117.1	96.1	168.0	694.8
Year	1074.5			872.9				

WYOMING EXHIBIT NO. 176

Sheet 17

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res. Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1934				
Oct.-Apr.	287.6	1673.4	1951.0	10.0	.0	.0	.0	.0
May	76.4	1951.0	1838.8	166.6	22.0	.0	24.0	142.6
June	15.0	1838.8	1613.4	218.6	21.8	.0	36.0	182.6
July	10.0	1613.4	1301.0	300.6	21.8	.0	51.0	249.6
Aug.	10.0	1301.0	1081.7	213.1	16.2	.0	33.0	180.1
Sept.	10.7	1081.7	970.6	114.0	7.8	.0	24.0	90.0
May-Sept.	122.1			1012.9	89.6	.0	168.0	844.9
Year	409.7			1022.9				
				1935				
Oct.-Apr.	179.6	970.6	1140.2	10.0	.0	.0	.0	.0
May	81.8	1140.2	1162.0	37.0	23.0	.0	24.0	13.0
June	316.5	1162.0	1276.6	188.9	13.0	.0	36.0	152.9
July	34.6	1276.6	1001.5	292.4	17.3	.0	51.0	241.4
Aug.	13.8	1001.5	774.6	228.8	11.9	.0	33.0	195.8
Sept.	17.4	774.6	694.1	92.1	5.8	.0	24.0	68.1
May-Sept	464.1			839.2	71.0	.0	168.0	671.2
Year	643.7			849.2				

WYOMING EXHIBIT NO. 176

Sheet 18

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE

Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1936				
Oct.-Apr.	355.4	694.1	1039.5	10.0	.0	.0	.0	.0
May	338.6	1039.5	1221.5	144.1	12.5	.0	24.0	120.1
June	212.2	1221.5	1181.9	236.0	15.8	.0	36.0	200.0
July	3.6	1181.9	889.5	280.7	15.3	.0	51.0	229.7
Aug.	29.1	889.5	676.5	231.4	10.7	.0	33.0	198.4
Sept.	20.3	676.5	597.7	92.8	6.3	.0	24.0	68.8
May-Sept.	603.8			985.0	60.6	.0	168.0	817.1
Year	959.2			995.0				
				1937				
Oct.-Apr.	393.0	597.7	980.7	10.0	.0	.0	.0	.0
May	269.5	980.7	1128.2	112.9	9.1	.0	24.0	88.9
June	266.6	1128.2	1184.5	200.0	10.3	.0	36.0	164.0
July	80.9	1184.5	1047.3	205.2	12.9	.0	51.0	154.2
Aug.	16.4	1047.3	821.0	230.4	12.3	.0	33.0	197.4
Sept.	29.2	821.0	744.4	98.6	7.2	.0	24.0	74.6
May-Sept.	662.6			847.1	51.8	.0	168.0	679.1
Year 1055.6				857.1				

WYOMING EXHIBIT NO. 176

Sheet 19

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE
Thousands Acre F. et

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1938				
Oct.-Apr.	446.8	744.4	1181.2	10.0	.0	.0	.0	.0
May	311.6	1181.2	1417.1	66.9	8.8	.0	24.0	42.9
June	363.2	1417.1	1519.1	245.2	16.0	.0	36.0	209.2
July	51.2	1519.1	1260.5	292.3	17.5	.0	51.0	241.3
Aug.	16.5	1260.5	1025.7	236.6	14.6	.0	33.0	203.6
Sept.	70.7	1025.7	1008.8	80.1	7.5	.0	24.0	56.1
May-Sept.	813.1			921.1	64.4	.0	168.0	753.2
Year	1259.9			931.1				
				1939				
Oct.-Apr.	348.3	1008.8	1347.1	10.0	.0	.0	.0	.0
May	198.3	1347.1	1404.5	127.5	13.4	.0	24.0	103.5
June	102.4	1404.5	1255.7	236.1	15.1	.0	36.0	200.1
July	20.0	1255.7	966.2	292.1	17.4	.0	51.0	241.1
Aug.	20.0	966.2	742.3	232.8	10.1	.0	33.0	200.8
Sept.	22.4	742.3	667.6	90.5	6.6	.0	24.0	66.5
May-Sept.	363.1			980.0	62.6	.0	168.0	811.9
Year	711.4			990.0				

WYOMING EXHIBIT NO. 176

Sheet 20

NORTH PLATTE RIVER
IRRIGATION DEMANDS AND STORAGE USE
Thousands Acre Feet

Period	1 Run-off	2 Storage Beg.	3 Storage End	4 Required Disch.	5 Res.' Losses	6 Spills	7 Demand Kendrick Proj.	8 Demand Whalen to Tri-State Dam
				1940				
Oct.-Apr.	238.1	667.6	895.7	10.0	.0	.0	.0	.0
May	150.3	895.7	925.3	115.1	5.6	.0	24.0	91.1
June	101.8	925.3	763.3	244.3	19.4	.0	36.0	208.3
July	15.0	763.4	473.0	290.9	14.5	.0	51.0	239.9
Aug.	15.0	473.0	261.1	213.3	13.6	.0	33.0	180.3
Sept.	19.7	261.1	169.3	111.4	.1	.0	24.0	87.4
May-Sept	301.8			975.0	53.2	.0	168.0	806.9
Year	539.9			985.0				

DIRECT TESTIMONY OF WYOMING WITNESS, ELMER K. NELSON RELATING TO WYOMING EXHIBIT 176

Record pages 27573-27582

(Page 27573)

Q.—Do you now have before you Wyoming Exhibit 176?

A.—I have.

Q.—Does that consist of twenty sheets?

A.—It does.

Q.—The first sheet is a sheet of notes or explanations, is it not?

A.—Yes, sir.

Q.—On this exhibit have you covered the 37-year period 1904 to 1940, inclusive?

A.—I have.

Q.—And information is supplied separately for each year, is it not?

(27574)

A.—Yes, sir.

Q.—Will you explain the form and setup of this exhibit as to each particular year?

A.—Yes, sir. On Page 2, the right-hand column, No. 8, are the values taken directly from the previous companion exhibit. Column No. 1—

Q.—Just a moment. You spoke of the previous companion exhibit. Which exhibit is that, by number?

A.—That is Exhibit 175.

Q.—And where is Column 8 portrayed in Exhibit No. 175?

A.—That is Column B of that exhibit.

Q.—That is what is designated in Exhibit No. 175 as the required release at Pathfinder.

A.—That is right.

Q.—In Exhibit No. 176 you have it labeled "Demand, Whalen to Tri-State Dam"?

A.—Yes, sir.

Q.—Does that mean the demand from Pathfinder?

A.—That is correct.

Q.—All right. Proceed with your explanation.

A.—Column 1 is the "Adjusted Run-off at Pathfinder," which is the same as Column B of the previous Exhibit No. 175. Column 7 is the diversion demand of the Kendrick project, which

has been analyzed and derived by a previous exhibit. Column 6 is spills from the reservoir system. Column 5 is the computed evaporation losses in the reservoirs. Column 4 is the sum of the values in Column 7 (27575) and Column 8, being the required discharge that is limited to the Kendrick project diversion, plus the demand of the Whalen-Tri-State dam section. And columns 2 and 3 are placed for convenient computation of storage conditions throughout the seasons and throughout the years.

The notes on Page 1, referring in particular to the note referring to Column 6, the reservoir storage which has been determined as the basis for determining spills is indicated in this note; that is, I have used the full active capacity of Seminoe Reservoir and I have used the full active capacity of the Pathfinder Reservoir. These are in previous exhibits and have heretofore been used by Nebraska and by the United States. They are not new values.

For the Alcova storage I have used the value of 180,000 acre feet, which is followed by the word "Mean." That leaves an additional capacity in Alcova of approximately 15,000 acre feet, which is left there for the purpose of equalizing and smoothing out these computed spills. That is, the waters which come to Pathfinder, in the same way for the same reason that I discussed a moment ago as to the waters which originate below Pathfinder, are erratic and do not occur in monthly sums uniformly as is suggested by the use of the monthly values. This 15,000 acre feet is to insure reasonable determination of the spill; that is, there might sometimes be 15,000 acre feet captured in this reservoir which, again, would be released and again be available to capture spills, or to control the run-off at times when the reservoirs were near capacity.

Q.—You have included in the note with relation to the (27576) storage in the reservoir, the statement that when the storage in the Alcova reservoir declines to 160,000 acre feet, the Kendrick Project will not divert water?

A.—I have.

Q.—You have already covered that exhibit, I believe, in your earlier testimony?

A.—Yes, sir.

Q.—Now, with reference to Column I of Exhibit 176, the "Run-off at Pathfinder", has that been adjusted to present conditions?

A.—Yes, sir. It has been adjusted to future conditions. It has—

Q.—By "adjustment to future conditions," do you mean that you have adjusted it to the additional depletion of the approximately 75,000 acre feet above Pathfinder?

A.—That is correct.

Q.—So it has been adjusted to existing conditions, and then an additional adjustment made for the additional depletion?

A.—That is correct.

Q.—Your required discharge in Column 4 is the sum, is it not, of the demand of the Kendrick project, Column 7, and the demand from Pathfinder for Whalen-Tri-State dam section, in Column 8?

A.—It is. In addition, I have shown, under the required discharge column, Column No. 4, an October-April discharge of 10,000 acre feet, which I have carried throughout the 37-year period.

Q.—What is the purpose of that, Mr. Nelson?

A.—I have recognized that in the past the Bureau of Reclamation (27577) has been required at times to discharge some flows from Pathfinder because of industrial uses in the Casper area, rather non-consumptive uses. I have assumed, of course, that the return flows from the Kendrick project would also increase the flow of the river in that vicinity. In connection with this release of 10,000 acre feet in the October-April period I have not at any time carried that water on down to Whalen; I have just assumed it lost; that is, that is stated because there will be that unbalance between figures if it is not understood that I have not carried the 10,000 acre feet through in the winter months as far as the water arriving at Whalen is concerned. It is not considered a part of that water.

Q.—Historically, has there been some October-April discharge since the operation of the Pathfinder reservoir?

A.—There has.

Q.—Do you know in what quantity, or have you those figures?

A.—Yes, sir. We have an exhibit which shows the historical conditions for the last ten-year period, the average discharge of which was 34,000 acre feet; but if we took out of that one or two extremely high years, which normally would not occur, the discharge or release which they did make would be a great deal smaller.

Q.—Is it your opinion that over a long period of time the

10,000 acre feet would be ample to cover the contingencies that you have mentioned?

A.—Yes, it is ample and probably would not always be necessary. It would depend upon precipitation and run-off—local precipitation, snows, and so on, during that time, which would at times make (27578) it entirely unnecessary to release that water. Nevertheless, throughout the drouth period, and throughout all years, 10,000 acre feet has been assumed to be discharged, which might not be necessary; it is a safety factor.

Q.—How have you determined the reservoir losses in Column 5 that you show on this Exhibit?

A.—I have a note on Column 5 which may require additional explanation. The recorded evaporation losses at Pathfinder were taken in 1915. There is a period of 1904 to 1914, inclusive, during which there were no data. I used from a Colorado exhibit the mean evaporation—the May-September evaporation of Pathfinder—and I found that throughout recorded periods it was high and low and varied approximately as the evaporation did at Fort Collins, Colorado, which covers the complete period. Therefore, I applied departures with respect to the Fort Collins station to the mean computed in the Colorado exhibit, for the May-September period, and divided that quantity between the May-September months in proportion to the division shown on the Colorado exhibit, which shows the occurrence during May-September of evaporation. That was applied then monthly to the mean reservoir surface during the month, first by a preliminary computation trial and error as to what the storage would be and what the surface area exposed would be, and then as the computation was carried through it was finally adjusted to what I believe the mean conditions were; so that the reservoir losses in Column 5 are computed on the basis of mean reservoir surfaces during the month.

Q.—Do your reservoir losses take into account throughout the (27579) period, and from month to month, the different exposed surfaces because of the differing amounts of water in the reservoirs?

A.—They do.

Q.—You started on this study, did you not, with reservoirs assumed empty at the commencement of the period?

A.—Yes, sir. At the beginning, October, 1904, in Column 2, it will be noted that the storage was zero.

Q.—Have you assumed throughout this exhibit the operations of all three reservoirs for the entire period?

A.—I have.

Q.—How did you compute the storage at the beginning and the end of the months?

A.—The computation is in this manner: Referring to sheet 2, the run-off October-April, 1904, was 365,000 acre feet which came to the storage units. At the end of the October-April period there would have been discharged 10,000 acre feet, and therefore there would have remained in storage 355,000 acre feet, and that is carried down to the storage as at the beginning of May, 1904; and the same computation then is made that the run-off of 328,500, plus the storage at the beginning of the month —355,000—is equal to the storage at the end of the month—581,500—plus the required discharge in Column 4—98,900—plus the reservoir losses of 3,100.

Q.—Was the same method used throughout the exhibit?

A.—That is correct.

Q.—Does this exhibit assume throughout the 37-year period the additional depletion above Pathfinder?

(27580)

A.—It does.

Q.—Does it assume throughout a complete supply for the Kendrick Project based upon the previous exhibit, where you set up the demands according to one of Mr. Conkling's exhibits?

A.—It does.

Q.—Does it assume throughout a complete supply for the Whalen-Tri-State Dam area in the amounts that have been set up on previous exhibits?

A.—Yes, sir.

Q.—Now, what conclusion did you arrive at in carrying this study through the 37-year period, at the end of the year 1940?

A.—That beginning with zero storage in 1904 all demands would have been fully met throughout the 37-year period.

Q.—Would there have been any water remaining in the reservoir system at the end of the period?

A.—Yes. That is indicated on Page 20, under Column 3, for the month of September as 169,300 acre feet.

Q.—From this study and applying the requirements that you have, then, have you found that there would have been a complete supply at all times, with 169,300 acre feet left in storage at the end of September, 1940?

A.—That is correct.

Q.—Mr. Nelson, are you to some extent familiar with the run-off between the years 1895 and 1904?

A.—I am not familiar with the run-off, but I am familiar with the values which have been computed by other engineers, which appear (27581) on Colorado exhibits, and also on the Wyoming exhibit, the Wyoming exhibit being an exhibit which was a report, prepared by Mr. Meeker, which was used in Wyoming Exhibit 100. These are computed amounts, but I am familiar with the nature of the run-off which would have occurred has these computed amounts been approximately correct.

Q.—Assuming the computed amounts for the 1895-1903 period to be approximately correct, could you have extended this study back commencing in the year 1895 and have had a complete supply for all of these requirements during the 1895-1940 period?

A.—Yes, sir. It wouldn't have changed the computation on this exhibit.

Q.—And that woud be a 46-year period, would it not?

A.—That is correct.

Q.—Mr. Nelson, in using the supply to meet the demands in the way that you have upon Wyoming Exhibit No. 176, were there any spills from the Seminoe, Pathfinder and Alcova reservoir system?

A.—Yes, sir.

Q.—Will you point it out on this exhibit? I believe the year 1907 is where the first spill appears.

A.—It is shown on Sheet 3. In 1907 the first spill occurred, and those spills continued more or less uniformly for three more years thereafter, up to 1911, on Sheet 5. Referring to Sheet 6, beginning with the year 1912, the years 1912 and 1913 and 1914 also indicated spills. Referring to Sheet 8, the year 1917 shows a very heavy spill, this being a very abnormal run-off year. The next (27582) several years, clear through 1924, beginning with 1917, all indicated spills of considerable magnitude. Referring to Sheet 13, for the year 1926, we find that for the succeeding years, being a five-year period, up until 1930, there were continuous spills.

Q.—Was 1933 the last year in which a spill occurred under this operation?

A.—It was. It was the only year in the drouth period, so-called, of 1931-1940, in which a spill would have occurred.

Q.—That is shown, is it not, on Sheet 16?

A.—That is correct.

Q.—You have in a later exhibit indicated what the mean annual average of these spills would be?

A.—I have.

Q.—That is used in another connection on a later exhibit, is it not?

A.—Yes, sir.

Q.—Do you have any additional explanation you care to make concerning Exhibit No. 176?

A.—No sir, I think we have covered it.

DIRECT TESTIMONY OF WYOMING WITNESS, ELMER K. NELSON, RELATING TO WYOMING EXHIBIT 170

Record pages 27528-27539.

(Page 27528)

Q.—Do you have before you Wyoming Exhibit No. 170?

A.—I do.

Q.—That consists of how many sheets?

A.—This exhibit consists of three sheets; two single sheets of notes and one folded page.

Q.—Are the first two sheets explanatory notes and notes giving the sources of the data contained in the exhibit?

A.—They are.

Q.—On this exhibit you have fourteen columns?

A.—That is correct.

Q.—The first column is the year.

A.—Yes, sir.

Q.—You have covered how many years, Mr. Nelson?

A.—The period 1904-1940, inclusive, being a 37-year period.

Q.—Why have you covered that period on this exhibit?

A.—That is the longest period for which records are available. In the earlier part, particularly in the earliest two or three years, (27529) only May-September, and occasionally an April record were available, but the other months have been computed and inserted into the record of this case, so that the values represented hereon are all annual values—water-year values.

Q.—Under the second column headed "NorthGate," what does that letter "e" following the first several years' measurements, indicate?

A.—That was copied from Nebraska Exhibit No. 3, which contained the letter "e". This explanation I can give, I think, from such exhibit, although it may be referred to directly: These

values were computed by Mr. Meeker—I do not recall whether in full or in part—but I believe that they were all computed for those years followed by the letter "e".

Q.—The same letter "e" appears opposite several values in Column 13. Would you explain that, please?

A.—They are estimated by me. They have no relation to the other "e".

Q.—And under Column 6, the Seminoe column, there are several figures followed by the letter "a". What is the explanation for that?

A.—As indicated on Page 1, note for Column 6, the values followed by "a" were derived by me from monthly correlation curve with Saratoga station data. It will be noted that they followed the first period approximately as of Column 2, but, in addition, includes four years, from 1926 to 1929, inclusive.

Q.—This exhibit contains certain data, does it not, arranged in (27530) down-stream order, commencing on the left and going down-stream?

A.—It does.

Q.—In Column 2, is that the water-year run-off at Northgate?

A.—All these values are water year values, yes, sir.

Q.—The values are in thousands acre feet througout?

A.—That is correct.

Q.—Then in Column 4 you have the Saratoga run-off, is that right?

A.—Yes, sir.

Q.—What is Column 3, in between the two, designation being "Gain, Net"?

A.—That is the computed difference between Column 4 and Column 2, being Column 4 minus the value of Column 2.

Q.—And Columns 4 and 6 have the Saratoga and Seminoe run-off, and in between, Column 5, "Gain, Net"?

A.—That is correct.

Q.—Will you explain that?

A.—Thit is the difference between the values of Column 6 and Column 4.

Q.—And that Column "Gain, Net" is the quantity determined in the same way as the other columns in the exhibit, is that right?

A.—That is correct.

Q.—Do you have means for the 37-year period at the bottom of the page?

A.—I do.

(27531)

Q.—At Northgate, 376,800 acre feet?

A.—Yes, sir.

Q.—With a net gain between Northgate and Saratoga of 547,700?

A.—That is correct.

Q.—Is a portion of that gain between Northgate and Saratoga attributable to run-off crossing from Colorado into Wyoming?

A.—It is.

Q.—And how much?

A.—Applied to the present condition mean—we are now speaking of the means of that line which is headed by "Means" —that is the historical mean of the values above, and to apply a correction to that, we would reduce it first to the present condition mean, because that is the computation of the Colorado exhibit, which indicates present conditions—how much water comes from Colorado into Wyoming below the Northgate gauging station.

Q.—Will you explain to the Court what method or formula you used in the last line on the page which is headed "Means, Present Conditions"?

A.—Yes, sir. The values of Column 8 are from Wyoming Exhibit 100—that is, from the column in such exhibit of historical run-off—below the value of which the average for the historical run-off is 1,316,000 acre feet, which has an asterisk before it, appears a value as of 1,293,000 acre feet, which is the average of the same period of run-off, present conditions, from Wyoming Exhibit 100. The relation between these two values has been applied to all the (27532) values to the left—the values at Northgate, Saratoga and Seminoe; that is, it is assumed that throughout this basin, as the Wyoming exhibit assumed, the relation between the present condition run-off and long-time historical run-off was approximately the same at any particular gauging station, and that is the relation heretofore assumed in previous exhibits of Nebraska.

Q.—Does the last line on the page purport to show what the run-off would be under present conditions based upon the historical period?

A.—It does, and with reference to such value under Column 3, being the gain from Northgate to Saratoga, or a value of 540,000 acre feet. Of that amount, referring to Note (i) on Page 2

of the exhibit, it is stated that the amount originating in Colorado—from Colorado exhibits—is 135,000 acre feet. Therefore, the contribution from Wyoming would be 405,000 acre feet, which is not shown separately on this exhibit.

Q.—In Column 9 what have you portrayed?

A.—In Column 9 are the net losses in Pathfinder reservoir.

Q.—How did you obtain those?

A.—I have computed those by the inflow-outflow method, taking into account storage; and they are for the May-September period.

Q.—In the first five years at the top of Column 9, the list is denoted as zero.

A.—The storage began in Pathfinder in 1909.

Q.—Can you explain the small discrepancy between the Column 8 (27533) figure, run-off into Pathfinder, and discharged from Pathfinder in Column 10, in those years when there was no reservoir loss?

A.—Yes. I took for the purpose of this study, the values in Column 8 from Nebraska exhibit 6 and Wyoming Exhibit 100, which were identical, and Column 10 I took from Colorado Exhibit 93. The Colorado exhibit indicates a larger run-off, for the most part, aggregating for the period where there is a defference, which is confined chiefly to the first three years of the period, approximately 100,000 acre feet, or averaging for the five years about 20,000 acre feet annually; but, so far as the 37-year period is concerned, it would not have any material effect. Had I used Nebraska exhibit data instead of Colorado exhibit data for Column 10, I would have had a smaller value and, therefore, the net gain of Column 11 would have appeared to be larger by just that same amount.

Q.—With reference to Column 9, where you have the net losses of Pathfinder, in the last line on the page, "Means, Present Conditions," you have the figure 45.0, indicating forty-five thousand?

A.—Yes, sir.

Q.—How do you arrive at that?

A.—I found that the actual long-time mean of computed data was 45,500, and assumed that a value close enough for use would be 45,000, covering the present conditions of the situation.

Q.—Well, would that cover losses solely on the Pathfinder, or on the three reservoirs?

A.—The Pathfinder losses. And, of course, after the other

(27534) reservoirs came into operation, you will find that the values for 1939 and 1940 are the values from the exhibit we produced yesterday. They are whatever losses occurred.

Q.—In Column 10 you have shown Pathfinder discharge, and Column 12 inflow at Guernsey. What is the mean gain between those two points?

A.—The mean historical gain is 287,000 acre feet, and under present conditions 10,000 acre feet less, or 277,000 acre feet.

Q.—Are all of these gain figures net figures, Mr. Nelson?

A.—They are.

Q.—And whatever use or uses may be made in any section, or whatever consumption was made from such uses, is automatically accounted for?

A.—That is correct.

Q.—Now, in this gain between Pathfinder and Guernsey, you showed on a previous exhibit, I believe, that in that area, historically, in the 1931-1940 period, there was diverted for irrigation from the main river 28,000 acre feet annually?

A.—That is correct.

Q.—The gain is after such use has been made, is it not?

A.—That is correct.

Q.—Is the contribution of that section of the river that you have indicated here likewise after uses have been made on the tributaries in that section?

A.—Yes.

(27535)

Q.—Whatever return flow comes from the irrigation upon the river would be automatically accounted for in the net gain?

A.—That is correct.

Q.—And whatever consumptive use occurred would likewise be accounted for?

A.—That is correct.

Q.—Will you explain Column No. 13, where you have "Net Gain L. R."?

A.—This column represents the run-off at the Laramie River mouth. The first eleven or twelve years of the period, followed by "E" are inserted to fill out the exhibit more than for their value; their value has not been used in the determination of any mean, but only the values from 1915 to the end of the period. The Laramie River at the mouth has been measured and recorded in detail since 1915, and these are the values that are placed herein.

Q.—These values take account of the diversions made from Laramie River for either power or irrigation uses?

A.—These are published values, which include such diversions.

Q.—In other words, this is the amount of water that would have arrived at the mouth of the river if the diversions had not been made?

A.—It is assumed to be that, yes.

Q.—In the last line, No. 14, you have, at the head of the column, "Net, Run-off, 12 plus 13". What is that?

A.—It is the sum of the values of Columns 12 and 13, but such (27536) average under the line "Means" is not particularly of any meaning so far as I have used it in determining the means present conditions. I should like to explain that. Beginning with the means, present conditions, under Column 8, and subtracting therefrom the mean reservoir loss from Pathfinder, we derive what the mean Pathfinder discharge would have been had the reservoir been completely emptied at the end of the period; and adding to this the mean gain from Pathfinder to Guernsey, as reduced to present conditions, we derive the value at Guernsey of 1,525,000 acre feet. The present condition mean run-off of Laramie River has been assumed here under present conditions to be some 40,000 acre feet less than the historical mean, and adding this to the value under Column 12 we derive the value of 1,615,000, which would be equivalent only as a mathematical quantity to the sums of the values preceding it.

Q.—Will you explain why you made the reduction as to the Laramie River in the line "Means, Present Conditions"?

A.—Yes. I believe that, if the storage on Laramie River as now developed had been in use throughout the period of the record, much of this water would not have flowed out into the North Platte River; it would have been saved in storage above, and would have increased the uses above—the increased consumptive uses above—and would have eliminated a large amount of that waste. Preliminary studies indicate that the reduction made on account of the Laramie River under present storage conditions would be about 20,000 acre feet a year. That still leaves a difference of 22,000 unacounted for (27537) which I can cover better, I believe, after we come to another exhibit. Ten thousand feet is assumed to take care of their reduction to present conditions of historical values in Column 11, being the gains between Pathfinder and Guernsey, and, although I might have to repeat this,

the other ten thousand or twelve thousand is for whatever losses might accrue to use of this net gain between Pathfinder and Guernsey and through the Guernsey reservoir and between Guernsey and Whalen; so that I think the total water as accounted for is indicated on this exhibit.

Q.—Does the supply of water at Guernsey include the Laramie River?

A.—Yes, sir.

Q.—And what would be available at that point or below for use, unless further depleted above?

A.—That is correct.

Q.—Now, in the gains throughout the area from Northgate to Guernsey, have you computed any total gains between the two points?

A.—I have.

Q.—Will you give us that information, please?

A.—Yes. The total gains throughout Wyoming would be 1,155,000, which, added to the 505,000 discharge from Colorado, would give a total water of 1,660,000 acre feet, which may be checked on the exhibit by adding to the value in the last column at the bottom the Pathfinder reservoir loss of 45,000.

Q.—In speaking now of these totals you are using the means under (27538) present conditions?

A.—I am.

Q.—How do you account for the 505,000 acre feet contributed from Colorado? What are the sources of that?

A.—The run-off at Northgate, Colorado, of 370,000 acre feet, plus the 135,000 acre feet which flows to Wyoming from Colorado at the gauging station, chiefly from Big Creek and Encampment River territories.

Q.—This amount of water is carried through, is it not, from Northgate to Guernsey after all losses have been accounted for?

A.—Yes. This is the net water.

Q.—And whatever conveyance loss there may be on the water originating in Colorado has been automatically taken out of the Wyoming quantity?

A.—Yes, sir. It is absorbed, section by section, by the computation of net values through Wyoming.

Q.—The Colorado quantity of 505,000 is the amount at or near the Colorado-Wyoming line?

A.—That is correct.

Q.—Under present conditions, of this supply of 1,615,000 acre

feet, after reduction of 45,000 acre feet Pathfinder loss, what use is made by Wyoming as to the acreage irrigated below Whalen from the main North Platte River?

A.—The use that is made of this water is all confined to the area from below Whalen to the Nebraska line, and that use is made upon the area in the Lingle-Hill Irrigation District, of about (27539) 14,200 acres; some 2,800 acres under the Pathfinder Irrigation District in Wyoming; some 18,000 acres under private canals in Wyoming, and the acreage in the Goshen Irrigation District, which I have not isolated.

Q.—Well, would an approximate figure for the lands irrigated from that supply in Wyoming be about 85,000 acres?

A.—Between 85,000 and 90,000, yes, sir, probably 85,000.

Q.—With reference to these net gain figures, directing your attention to the situation above Pathfinder, there is a considerable amount of irrigation on the tributaries in Wyoming above Pathfinder, is there not?

A.—There is.

Q.—And are these net gains residual from the standpoint that the uses and the consumption of the irrigation above Pathfinder has been accounted for?

A.—Yes, sir; these net gains are under present conditions or uses in operation.

Q.—And, of course, excluding conveyance loss on tributaries?

A.—Yes, they are net water.

WYOMING EXHIBIT NO. 170

NORTH PLATTE RIVER IN WYOMING

SECTIONAL NET GAINS, HISTORICAL, AND RUN-OFF AT GAUGING STATIONS

Sources of Data

Col. 2. Nebraska Exhibit 3, Colorado Exhibit and later Published Data.

Col. 4. Nebraska Exhibit 4 and later Published Data.

Col. 6. Nebraska Exhibit 5 and later Published Data. Values followed by "A" derived by Nelson from monthly correlation curve with Saratoga Station data.

Col. 8. Nebraska Exhibit 6 and Wyoming Exhibit 100 with correction noted in Colorado Exhibit 93.

Col. 9. Computed by Nelson from Exhibits of Flow and Storage Data. Values are Net May-Sept. Losses.

Col. 10. Data for 1904-1908 from Colorado Exhibit 93. Total difference as to Col. 8 about 20,000 acre feet annually.

Col. 12. Pertinent Nebraska and Colorado Exhibits.

Col. 13. Run-off of Laramie River at Mouth. Data from Nebraska Exhibit 11 and Colorado Exhibit 98 and later Published Data. Contributions to Section of other tributaries, not return flow from North Platte River diversions, is not known.
Values followed by "E" are estimated from related data by Nelson but are not used in Means.

Notes

(a) Seminoe Canyon flow plus Seminoe Reservoir Storage end of year plus 4,000 acre feet Reservoir evaporation loss estimated.

(b) Sum of North Platte River above Seminoe Reservoir and Medicine Bow River above Seminoe Reservoir.

(c) In Col. 2, values followed by "E" are by Meeker, Neb. Ex. 3, and fall midway between values of Colo. Ex. 10 and studies by Nelson by correlating monthly values with Saratoga flows.

(d) See note for Col. 9.

WYOMING EXHIBIT NO. 170

NORTH PLATTE RIVER IN WYOMING

SECTIONAL NET GAINS, HISTORICAL, AND RUN-OFF AT GAUGING STATIONS

Notes

(e) See note for Col. 10.

(f) 1904-1940 average of values of Col. 13 = 140.0 The value given is the average of the period, 1915-1940.

(g) Value of Exhibit reduced 100,000 acre feet. During the month of June the Published value was 601.0, whereas the record of Run-off into Pathfinder is given at 542.0. It appears that the gauging station record for Seminoe Canyon was partially estimated. The value given is therefore reduced.

(h) Sum of Means of Cols. 12 and 13.

(i) Originating in Colorado, from Colo. Ex., 135.0.

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NORTH

SECTIONAL NET GAINS, HI
YEARLY FLOWS AT

1 Year	2 Northgate	3 Gain, Net	4 Saratoga	5 Gain, Net	6 Seminoe
1904	(c) 410.0 E	587.8	997.8	195.2	1193.0 A
1905	370.0 E	539.9	909.9	180.1	1090.0 A
1906	420.0 E	602.5	1022.5	200.5	1223.0 A
1907	530.0 E	768.0	1298.0	396.0	1694.0 A
1908	270.0 E	394.0	664.0	157.0	821.0 A
1909	730.0 E	1040.4	1770.4	476.6	2247.0 A
1910	250.0 E	359.0	609.0	241.0	850.0 A
1911	360.0 E	525.0	885.0	183.0	1068.0 A
1912	500.0 E	718.1	1218.1	364.9	1583.0 A
1913	360.0 E	511.1	871.1	256.9	1128.0 A
1914	490.0 E	716.9	1206.9	228.8	1435.7
1915	278.7	340.2	618.9	204.0	822.9
1916	375.2	512.1	887.3	163.0	1050.3
1917	626.5	973.6	1600.1	694.4	2294.5
1918	454.6	638.5	1093.1	275.1	1368.2
1919	221.0	391.3	612.3	186.5	798.8
1920	484.0	761.5	1245.5	445.9	1691.1
1921	508.9	844.1	1353.0	306.1	1659.1
1922	275.9	484.4	760.3	270.0	1030.3
1923	506.3	560.5	1068.8	324.1	(g) 1392.9
1924	396.9	436.8	833.7	388.6	1222.3
1925	319.4	518.4	837.8	303.4	1141.2
1926	532.1	729.3	1261.4	374.6	1636.0 A
1927	415.6	614.0	1029.6	311.4	1341.0 A
1928	506.8	742.1	1248.9	377.1	1626.0 A
1929	523.5	695.6	1219.1	321.9	1541.0 A
1930	345.2	345.7	690.9	159.5	850.4
1931	182.4	297.8	480.2	108.1	588.3
1932	440.1	583.3	1023.4	341.4	1364.8
1933	258.8	473.1	731.9	307.9	1039.8
1934	89.1	149.4	238.5	73.8	312.3
1935	200.6	328.1	528.7	120.9	649.6
1936	332.1	470.0	802.0	171.9	973.9
1937	215.0	430.7	645.7	257.4	903.1
1938	400.3	533.7	934.0	256.9	1190.9
1939	204.7	351.4	556.1	83.9	(a) 640.0
1940	155.3	295.6	450.9	72.6	(b) 523.5
Means.....	376.8	547.7	924.5	264.5	1189.0
*Means, Present Conditions....	370.0	(i) 540.0	910.0	260.0	1168.0

* Based on Wyo. Ex. 100.

WYOMING EXHIBIT NO. 170

R IN WYOMING

RUN-OFF AT GAUGING STATIONS

ATIONS; OCT. 1.—SEPT. 30

e Feet

9 Losses Net	10 Pathfinder Discharge	11 Gain, Net	12 Guernsey	13 Net, Gain L.R.	14 Net, Run-off (12) + (13)
(d) .0	(e) 1276.4	295.3	1571.7	135.0 E	1706.7
.0	1229.0	519.0	1748.0	170.0 E	1918.0
.0	1386.0	387.0	1773.0	173.0 E	1946.0
.0	1842.3	591.1	2433.4	295.0 E	2728.4
.6	918.6	603.2	1521.8	125.0 E	1646.8
19.8	2231.3	275.5	2506.8	305.0 E	2811.8
19.0	1008.6	176.6	1185.2	65.0 E	1250.2
23.9	1098.4	92.2	1190.6	65.0 E	1255.6
45.7	1470.0	274.5	1744.5	170.0 E	1914.5
41.1	1310.5	236.3	1546.8	130.0 E	1676.8
68.2	1312.5	178.5	1491.0	120.0 E	1611.0
41.7	945.1	349.0	1294.1	91.4	1385.5
50.8	1156.0	205.0	1361.0	71.3	1432.3
71.0	1994.1	580.7	2574.8	397.4	2972.2
64.2	1498.3	526.1	2024.4	191.5	2215.9
62.8	1116.6	115.2	1231.8	70.4	1302.2
70.7	1373.8	490.4	1864.2	194.6	2058.8
67.1	1791.7	163.8	1955.5	167.1	2122.6
64.0	1356.4	170.3	1526.7	89.5	1616.2
56.2	1087.3	389.2	1476.5	131.7	1606.2
62.8	1876.1	351.9	2228.0	239.8	2467.8
38.2	1285.5	265.8	1551.3	72.8	1624.1
49.4	1446.4	242.5	1688.9	191.5	1880.4
66.7	1278.8	332.7	1611.5	183.4	1794.9
56.8	1749.8	301.3	2051.1	216.1	2267.2
65.2	1719.9	387.3	2107.2	275.0	2382.2
53.4	1206.5	278.2	1484.7	177.0	1661.7
36.0	1004.0	242.0	1246.0	99.8	1345.8
36.8	1311.2	192.4	1503.6	76.8	1580.4
39.3	1147.3	368.2	1515.5	73.2	1589.1
14.0	485.3	107.3	592.6	36.3	628.9
16.1	677.6	169.5	847.1	67.0	914.1
25.8	1017.2	74.7	1091.9	60.1	1152.0
26.6	1049.4	229.3	1278.7	72.6	1351.3
43.0	975.5	212.0	1187.5	80.4	1267.9
38.6	991.5	153.7	1145.2	54.6	1199.8
24.0	548.9	95.6	644.5	40.2	684.7
45.5	1275.0	287.0	1562.0	(f) 132.0	(h) 1694.0
45.0	1248.0	277.0	1525.0	90.0	1615.0

Tightly Bound

WYOMING EXHIBIT No. 171

NORTH PLATTE RIVER

(Data from U. S. Ex. 143, Sheet 5; Conkling)

***NET DEMAND OF KENDRICK PROJECT

Thousands Acre Feet

I Diversions

Oct.	Nov-Mar.	April	May	June	July	Aug.	Sept.	Total
0	0	0	24.0	36.0	51.0	33.0	24.0	168.0

II Return Flows

9.4	33.0(a)	7.5	7.4	7.5	7.7	11.3	12.2	96.0

III Net Irrigation Demand at Alcova;

	16.6	28.5	43.3	21.7	11.8	122.0
***Round Numbers,	17.0	28.0	43.0	22.0	12.0	122.0

IV Return Flows Available for Supplementing mean Oct.-April Diversion by Interstate Canal to Storage:

9.4	7.5	17.0

(a) Assumed for these months 9, 8, 5, 5 and 6 thousand acre feet respectively.

EXCERPTS FROM WYOMING EXHIBIT 173

Sheet 14

MEANS—1904-1940

	May	June	July	August	Sept.	Year	May-Sept.
Line 10. Historical Gain Pathfinder to Whalen	72,200	38,500	7,00	4,900	18,200	287,000	141,000

MEANS—1931-1940

	May	June	July	August	Sept.	Year	May-Sept.
Line 10. Historical Gain Pathfinder to Whalen	32,400	9,100	-2,800	5,800	24,700	184,500	69,300

Note: All values in acre feet.

EXCERPT FROM UNITED STATES EXHIBIT 267 ENTITLED "REQUIREMENT MAY-SEPTEMBER OF INTER-STATE AND FORT LARAMIE CANALS"

Fort Laramie Canal	291,000 acre feet
Lingle and Hill Irrigation Districts	53,500 acre feet
Pathfinder Irrigation District	378,800 acre feet
Total	723,300 acre feet

EXCERPT FROM UNITED STATES EXHIBIT 269 ENTITLED "IRRIGATION REQUIREMENT MAY THROUGH SEPTEMBER FOR STATE LINE CANALS AND REGULATION"

Tri-State Canal	192,100 acre feet per year
Northport Canal	60,000 acre feet per year
Gering Canal	35,600 acre feet per year
Mitchell Canal	34,100 acre feet per year
Excess for Regulation	25,000 acre feet per year
Less Tri-State Interceptions	—39,000 acre feet per year
Total	307,700 acre feet per year

ASSUMED DEMAND OF KENDRICK PROJECT

Column 29, U. S. Exhibit 273

May	19,200 acre feet
June	34,000 acre feet
July	51,400 acre feet
August	51,200 acre feet
September	29,000 acre feet
Total	184,800 acre feet

REQUIREMENTS OF WHALEN-TRI-STATE DAM SECTION USED IN UNITED STATES STUDY, UNITED STATES EXHIBITS 267 TO 273.

Testimony of Barry Dibble, United States Witness, Record page 28699:

(28699)

Q—Will you refer now to Column 45, which is headed "Draft on Guernsey to supply State line demand and intermediate canals," and explain the meaning of the heading and the derivation of the values?

A—Under Column 45, the "Draft to supply the State line canals" means the demand to supply the Mitchell, Gering and Tri-State Canals, including also the diversion for the Northport project and the preferred rights of the Tri-State canal, plus the allowance of 5,000 acre feet per month for regulation at the Tri-State Dam. The intermediate canals are meant to include the Wyoming canals between Whalen and the State line, and this includes the Burbank, the Lucerne, the Gratton, the Rock Ranch, Torrington, North Platte, Narrows, Ferris No. 1 and French. The plan followed is described in Note J on Sheet 7, which indicates how this computation is made. In making the computation in this way, the calculation has been made based upon the historic requirements of these intermediate canals.

Q—By that, you mean that the Wyoming private canals between Whalen and the State line have been permitted to divert the amount of water which historically they did divert?

A.—Yes. They have not been assembled in detail. The calculation has been made from the net accretions in the river in such a way as to allow for the full historic requirement.

EXCERPTS FROM TESTIMONY OF C. F. GLEASON, CONCERNING U. S. EXHIBIT 204-A

DIRECT EXAMINATION, RECORD PAGES 27979 TO 27989

(Page 27979) December 2, 1941.

Q.—Will you state your full name, Mr. Gleason?

A.—C. F. Gleason.

Q.—What is your age, Mr. Gleason?

A.—Fifty-eight.

Q.—What is your residence?

A.—Guernsey, Wyoming.

Q.—What is your profession or occupation?

A.—Engineer.

Q.—Are you now employed by the United States Bureau of Reclamation?

A.—Yes, sir.

Q.—How long have you been employed by that agency?

A.—Since 1907.

Q.—What position do you now hold with the Bureau?

(27980)

A.—Superintendent of Power.

Q.—Will you please state, briefly, the functions and responsibilities of that position?

A.—I am in charge of the power system of the North Platte project and of the storage of water and the diversion works of the North Platte project.

Q.—In ordinary parlance, are you, in effect, the manager of the North Platte project?

A.—Yes.

Q.—In such position, is it your responsibility to operate the reservoirs of the project and to effect the delivery of storage water, generally, to the canals of the project and to the lands under canals having Warren Act contracts?

A.—Yes.

Q.—In effecting the deliveries of water from the reservoirs, is there need for determining the amount of storage water that is lost in transit from the two upstream reservoirs to the Guernsey reservoir or to point of diversion at Whalen?

A.—Yes.

Q.—Will you please explain why that necessity arises?

A.—At times when storage water is being carried in the North Platte River, it is essential to compute the rate of flow of storage water at Guernsey and Whalen, in order to determine the rate of natural stream flow.

Q.—Do I understand from that, Mr. Gleason, that in making diversions (27981) you find it necessary to make a distinction between natural stream flow on the one hand and storage water on the other hand?

A.—Yes, that is necessary in a good administration.

Q.—And the determination of the losses to be charged against storage water is a necessary part of the larger determination of the natural flow and storage?

A.—Yes.

Q.—Is there a need to determine losses in storage water be-

tween Whalen and the Wyoming-Nebraska State line?

A.—Yes.

Q.—Is that for the same reason?

A.—The same reason.

Q.—Have you ever had discussions with Mr. R. H. Willis, the Chief of the Nebraska Bureau of Irrigation, water power and drainage, and with the State Engineer of Wyoming, regarding the computation of the loss to storage water from Pathfinder dam to the Wyoming-Nebraska State line?

A.—Yes, we first had discussions regarding that matter in 1931 and we have had them at various times since.

Q.—I hand you a document which is Nebraska Exhibit 88-A entitled "Evaporation Charge on Reservoir Water Conveyed in the Channel of the North Platte River from Pathfinder Reservoir to Wyoming-Nebraska Line, as agreed upon at Guernsey office, U. S. Bureau of Reclamation, on May 26, 1931, by C. F. Gleason, Engineer, U. S. Bureau of Reclamation, John A. Whiting, State Engineer of Wyoming, and R. H. Willis, (27982) Chief of the Bureau of Irrigation, Nebraska." Are you the C. F. Gleason referred to in that heading?

A.—Yes.

Q.—Please keep that document before you while I hand you a document which has been marked for identification as United States Exhibit 204-A. Do you recognize the documents contained in United States Exhibit 204-A?

A.—Yes, they are copies of correspondence from the files of the Bureau of Reclamation at Guernsey.

Q.—Are those, to your knowledge, authentic copies of the original official document?

A.—They, they are authentic copies.

Q.—Where are the original copies? Do you have them here with you?

A.—I have the original copies of the correspondence, and later I received a letter from Mr. Bishop and one, I believe from Mr. Willis.

Q.—Do you have the official file copies of the correspondence written by you which is included in this exhibit?

A.—Yes.

Q.—Are all of the materials which are copied into this exhibit part of the official records of your office in ordinary and regular official use?

A.—Yes.

(27983)

Q.—Mr. Gleason, will you refer to Sheet 1 of United States exhibit 204-A, and state whether the acreage figures shown in Column 1 of the tabulation were the foundation for the losses as evaluated in second feet shown on Nebraska Exhibit 88-A?

A.—Yes, those are the acreage figures we used in 1931.

Q.—And are those figures stated in that column the figures which are stated in the first paragraph of Sheet 1, following the tabulation, which were, as marked, abandoned in March, 1940?

A.—Yes, those are the figures that we used in 1931 and marked "Abandoned March, 1940."

Q.—Will you please turn to Page 3 of this Exhibit 204-A? Page 3 purports to be a memorandum headed "U. S. Bureau of Reclamation, North Platte Project. Basis for computing reservoir evaporation losses and river carriage losses on storage water, season of 1940." Will you state the origin of this memorandum?

A.—That was gotten out by myself along, I think, in March, 1940, or soon thereafter. It doesn't seem to be dated, but it was in the spring of 1940.

Q.—Was a copy of that memorandum sent to Mr. Willis as an (27984) enclosure with your letter of May 20th, 1940, which is Sheet 2 of this exhibit?

A.—Yes.

Q.—Was a copy of it also sent to Mr. Bishop, the State Engineer of Wyoming, as an enclosure with your letter of May 20th addressed to him, which is Sheet 5 of the exhibit?

A.—Yes, that is correct.

Q.—Will you state, Mr. Gleason, what is the significance of the tabulation which appears near the bottom of the memorandum on Sheet 3 of Exhibit 204-A?

A.—The areas as given there for the different sections of the river were determined from aerial photographs of the river, which we did not have in 1931, at the time we made up the area in 1931. We did not have any actual data as to the river surface at that time, so it had to be assumed, but in 1937 and 1938 there were aerial photographs taken of the entire river from Alcova to the State line, and these areas adopted in 1940 were taken from those photographs.

Q.—What is the significance of the variation in the tabulation labeled "Daily Loss—Second Feet"?

A.—The figures of daily loss in second feet are computed from the areas of the section and from the evaporation record at

Pathfinder reservoir. That evaporation record was also corrected in 1940 to take in the years of record that had accumulated since 1931, and a co-efficient of seventy per cent is used to reduce the evaporation records with a standard Weather Bureau Class A pan to open water. (27985) surfaces.

Q.—And the area to which you apply this corrected evaporation factor is the area shown in the first column of the table on Sheet 3, is that correct?

A.—That is correct.

Q.—Is there any discrepancy between the areas shown in the first column of that table and the comparable areas shown in Column 2 of the tabulation on Sheet 1 of the exhibit?

A.—The same values are used in Column 2 of Sheet 1. The area is the same as that used in the computation.

Q.—Have the losses computed in accordance with the table shown on Sheet 1 of the exhibit been used by you during the years 1940 and 1941 in determining the losses chargeable to storage water from the Pathfinder reservoir?

A.—We started off in 1940 to use them, but later in the year objection was raised by the Farmers Irrigation District as to the resulting computation of the natural flow at the State line, and, as a result of that—there was involved other matters, however, besides the evaporation, particularly the time interval—we abandoned that plan for the balance of the 1940 season and used a substitute plan for computing the natural flow at the State line. For the year 1941 my computations have been based again upon this plan which we proposed in May, 1940.

Q.—Why did you defer until 1941 the use of the plan which you originally proposed and originally used in 1940?

(27986)

A.—The substitute plan used in 1940 worked fairly well for the conditions we had then, but it involved an estimate of the tributary inflow below Pathfinder, and in 1940, for the months of August and September, the creeks were usually dry, or practically so, so they were not a factor in the problem. However, in 1941 we found there was considerable water in those creeks the greater part of the time, and the plan that we used in the latter part of 1940 did not appear to mbe to work any longer because there was no way of computing or estimating the inflow from those creeks and we were not able to obtain daily reports of the flow, and, therefore, it appeared to me that the original plan was best for the conditions that we have had this year.

Q.—Have you furnished your computations based upon the tabulation appearing on Sheet 3 of Exhibit 204-A, regularly to Mr. Willis during 1941 and during that period of 1940, or that portion of 1940, in which you used that method of computation?

A.—Yes, we have furnished him daily computations during the season when storage water was being run in the river.

Q.—Has Mr. Willis communicated any objection to you, or indicated that he had any objection to that method of calculation of evaporation losses?

A.—I do not understand that he is objecting to the method of computing the evaporation losses.

Q.—Has he communicated to you any objection to that method?

A.—Not regarding the evaporation losses. We have had some discussion (27987) regarding the matter of the time interval, for the water to flow from that section of the river, and possibly regarding the bank storage, and other factors that appear to be in the problem, but I do not understand and I have not understood that Mr. Willis has raised any question about the evaporation losses, although he has not given me any written communication verifying it.

Q.—I call your attention to the last paragraph of the letter which is contatined on Sheet 1 of this exhibit, and to the last sentence of this paragraph, which reads—"Until further checking has been given this matter, figures of Column 2 will be used." Have you had any notification or any other type of information from Mr. Willis that he is no longer satisfied with the figures in Column 2?

A.—I don't recall any. I don't find any communication in the files. I searched them rather carefully, and I do not find any communication further about that.

Q.—In your judgment is the exposed surface area on which the losses are computed, as shown on the third sheet of this exhibit, more accurate than that shown in Column 1 of Sheet 1 of the exhibit?

A.—Yes, it would be my opinion that the latter figure, determined from aerial photographs, was more accurate.

Q.—And there were no measurements of that type available in 1931, at the time that the figures shown in Column 1 of Sheet 1 were tentatively agreed upon?

A.—No. About all we did was to estimate that the river was about so wide and so long, and we made a very rough calcula-

tion of (27988) the area, and it appeared that we were quite materially in error.

MR. KIRGIS: That is all.

NEBRASKA CROSS-EXAMINATION, RECORD PAGES 27989 TO 28008.

(Page 27989)

Cross-Examination by Mr. Good:

Q.—Mr. Gleason, you have before you United States Exhibit 204-A, which Mr. Kirgis identified by you yesterday?

A.—Yes, I have that exhibit.

Q.—I note that the correspondence contained on these six sheets ends on May 29th, 1940, which is the letter on the sixth sheet, dated May 29th, 1940, from L. C. Bishop to yourself?

A.—Yes.

Q.—Is there any later correspondence relating to this subject between yourself and the Nebraska Irrigation authorities?

A.—There is other correspondence relating to the subject of the method of computing the natural flow, but I do not find anything else (27990) that seems to have any probable bearing upon this subject of evaporation losses. However, there is other correspondence which may relate in part to this matter.

Q.—You stated that in July of 1940 another schedule was adopted?

A.—Yes.

Q.—Do you have a copy of that schedule?

A.—I don't have it before me. I think I have it in my material somewhere. I took a little look for it this morning but I didn't find it.

Q.—That came about, I believe you testified, by reason of the complaints and disagreements as between the Tri-State and the Northport with reference to storage water for Northport and the carriage of that in the Tri-State Canal, is that correct?

Q.—Isn't that the fact, Mr. Gleason?

A.—As I remember, that particular complaint from the Farmers District was in regard to the amount of natural flow that they were receiving. I do not believe that the Northport was involved upon that particular occasion.

(27991)

Q.—At any rate, about the 25th of July, you came to Bridgeport and there you met with Mr. A. W. Hall, did you not?

A.—Yes.

Q.—Who is Mr. Hall?

A.—He was in charge of Mr. Willis' office at Bridgeport, as I remember, at the time. I don't believe Mr. Willis was there.

Q.—And Mr. Hall is second in command in that office?

A.—I believe so.

Q.—At that time, you and he worked out another schedule differing from that shown in United States Exhibit 204-A, did you not?

A.—Yes.

Q.—And Mr. Hall undertook to recommend that schedule to Mr. Willis?

A.—I suppose so. I am not sure about that.

Q.—Then, on July 31st, you and Mr. John Whiting of the Wyoming Irrigation Department came down and met at Bridgeport with Mr. Willis and Mr. Hall, did you not?

A.—I believe so.

Q.—And at that conference you agreed to abandon the May, 1940, schedule, and to adopt a new schedule, is that right?

A.—Yes, that is correct.

Q.—That new schedule was in force for the remainder of the season of 1940?

A.—That is correct.

Q.—Was anything said in that conference on July 31st, 1940, as (27992) to whether you would ever revert to the May, 1940, schedule?

A.—It was my understanding that we would adopt the plan only for the time being for trial, and to get by the difficulty that we were having in trying to agree, under the conditions that then existed, upon a formula for computing the natural flow at the State line available to the Tri-State and Fort Laramie Canals, but it was never my intention to agree to it as a permanent formula.

Q.—The only thing that Exhibit 204-A shows as to the agreement by Nebraska to the May, 1940, schedule is the statement—"Until further checking has been give this matter, figures of Column 2 will be used"? That is found in Mr. Willis' letter of March 20th and is Sheet 1 of Exhibit 204-A?

A.—Yes.

Q.—That is all you have from Mr. Willis as to his agreement, is it not?

A.—I believe so.

Q.—So that Mr. Willis' agreement to the May, 1940, schedule, was likewise tentative?

A.—Yes, that is correct.

Q.—There was nothing said on July 31st, 1940 in the conference held at that time, about your reverting to the May, 1940, schedule?

A.—I don't remember what was said at the conference regarding that, or whether the matter was mentioned at all. I don't remember that it was.

Q.—It really wasn't mentioned at all. That is what I was getting at.

(27993)

A.—I don't remember that it was.

Q.—Accordingly, for the remainder of the season of 1940, commencing with July 31, the computation of natural flow and storage at the State line was made on the basis of the schedule tentatively agreed upon on July 31st?

A.—Yes.

Q.—We do not have that schedule before us here?

A.—No, I don't have it before me.

Q.—Do you recall how it differed from the May schedule?

A.—It was an entirely different formula, and I don't remember it well enough to attempt to state what it was without having the instrument before me.

Q.—Did you ever send a written memorandum of that schedule to Mr. Willis or to the Nebraska Bureau of Irrigation?

A.—As I remember it, it was typewritten in Bridgeport and they sent me a copy, I believe. I am not sure about that, however.

Q.—Mr. Whiting neither agreed nor disagreed in this conference on July 31st, 1940, as to whether that was acceptable to Wyoming or not, isn't that correct?

A.—As I remember it, that is correct.

Q.—Mr. Whiting was the State Hydrographer of Wyoming?

A.—Yes, I think that is the correct title.

Q.—At any rate, he was there representing the Wyoming State Engineer, Mr. Bishop, was he not?

(27994)

MR. WEHRLI: That is objected to as calling for a conclusion and an opinion of the witness, as undoubtedly it calls for an interpretation of the laws of Wyoming.

Q.—Would you answer the question, if you can?

A.—I was not advised as to whether he was sent there as a representative of the State Engineer or not.

Q.—Did you inform the State Engineer of Wyoming that you were about to have this conference on this subject previously to July 31st?

A.—I think not. It was a rather informal conference, and I don't think that I did advise Mr. Bishop.

Q.—How did Mr. Whiting happen to come up there?

A.—I don't remember. I expect that—he was located at Torrington, and we probably called him on the phone or happened to see him and invited him down.

Q.—Earl Lloyd was also there, was he not?

A.—I don't remember.

Q.—He is the Deputy State Engineer of Wyoming?

A.—I believe so.

Q.—So, at least, Earl Lloyd was notified of that meeting, was he not?

A.—I don't remember.

Q.—When was there next any discussion between you and anybody connected with the Nebraska Bureau of Irrigation as to the adoption of the schedule for computing the losses and the amount of natural (27995) flow and storage at the State line?

A.—That matter has been informally discussed upon quite a number of occasions. I don't remember the dates. I think, however, that we did discuss the matter again in 1940, in the fall.

Q.—About when?

A.—I don't remember.

Q.—Was any conclusion reached at that discussion in the fall of 1940?

A.—No, not as far as I was concerned.

Q.—About May 4th, 1941, you called Mr. Willis by telephone and asked to make an appointment to discuss the schedule with him and Mr. Whiting, did you not?

A.—I believe so.

Q.—And Mr. Willis told you to take it up with Mr. Hall, and suggested the next week as the time for the conference?

A.—That is correct, as I remember it.

Q.—On May 27th, then, which was Tuesday, you and Mr. Whiting came to the office after lunch at Bridgeport, did you not?

A.—I think that is correct.

Q.—And discussed the determination of a formula on this

problem of natural flow and storage reaching the State line?

A.—Yes.

Q.—Do you recall that a tentative plan was agreed upon by those present which you undertook to submit in writing?

A.—We tried to find a formula based upon some past figures that (27996) would apply, and we did discuss a tentative outline of such a formula.

Q.—And that formula differed from the one of May 20th, 1940, did it not?

A.—I believe it did.

Q.—And differed also from the one of July 31st, 1940?

A.—Yes.

Q.—It related largely to the question of the time interval or lag in getting the water from the Alcova reservoir to the Guernsey reservoir, did it not?

A.—Yes. That has always been the main point of discussion and it was discussed in this meeting—the time interval of water to travel from Alcova to Guernsey, which is variable. It varies with the amount of water flowing in the river and it varies with the change in the flow that is made—a large change in the flow apparently travels at a different rate than a small change—and it is a very, very problematical factor to attempt to make a formula to fit, and frankly, I have not been able to make one, and I would be glad to continue the discussions with Mr. Willis and the State Engineer of Wyoming to see if such a formula can be made.

Q.—For the purposes of day-to-day deliveries, it is very important to have that time interval correct, is it not?

A.—Yes.

Q.—In other words, the river cannot be administered as between natural flow and storage at the State line without having a reasonably (27997) correct time interval figure, isn't that right?

A.—Yes, that is correct.

Q.—So that the operation of the entire schedule depends upon that time interval as one of the factors?

A.—Yes, the exact formula used for the time interval affects the figure, the computed figure, for the natural flow from day to day. It is not so important as reflecting overall figures for the natural flow over a period of a month or season, but it is important from an administrative standpoint to have a fairly accurate figure every day.

Q.—The discussion on May 27th, 1941 revolved about an at-

tempt to apportion the differences in flow and the time interval of the different percentages of the change in flow, did it not?

A.—Yes. For instance, it appears from a study of past records that, for example, with a flow of four or five thousand second feet in the river, a sudden reduction of, say, a thousand second feet at Alcova begins to reach Guernsey in two days, but it is not complete, apparently for four days, and that is the reason that the ordinary three-day interval which we used in a calculation does not fit, and it seems necessary to make another correction to account for that. For instance, it does not affect the overall losses over the total period, but for the second day we have to use a correction, perhaps a plus correction, and then deduct it out again on the third and fourth days, and at the end of that time the adjustment has been made and it comes out so that the river has been neither depleted (27998) nor any accrual made of the natural flow, or storage, either.

Q.—At any rate, you reached a tentative agreement on May 27th which you were to reduce to writing, but, for some reason, you didn't?

A.—I think I promised I would attempt to reduce it to writing, but after further study, after I returned to Guernsey and gave the matter further study, I decided that it was of very doubtful practicability, and after starting in the season I attempted to use it but I was not very successful at it, and I finally largely abandoned it.

Q.—That is, you started out the season of 1941 with the May 20th, 1940, schedule, modified by this verbal discussion of May 27th, 1941, and then abandoned that, is that correct?

A.—In my computations for 1941, I did not use the schedule that we attempted to set up in the spring of 1941 at all. I really abandoned it after the computation of the storage and carriage losses was started.

Q.—Did you ever discuss with Mr. Willis or Mr. Hall about the abandonment of that tentative agreement of May 27th, 1941?

A.—Well, I believe so.

Q.—Do you recall when?

A.—No, I don't, but it was a very informal discussion. We had no further formal meetings regarding the matter during the irrigation season. However, I sent him the daily computations.

Q.—You sent him the daily computations, but you never had any discussion after May 27th, 1940, with either Mr. Willis

or Mr. Hall (27999) as to what formula would be used for the year 1941?

A.—The computations themselves show the method being used, and their attention was invited to that, at least informally.

Q.—Yes, but you never actually discussed with him whether it was agreeable with him or with Mr. Hall for you to use the May, 1940, schedule for the season of 1941?

A.—The May, 1940, schedule merely referred to evaporation losses. It did not refer to this matter of time interval correction at all. The May, 1940, schedule covers evaporation only, and it is not a complete formula. It never was and is not yet.

Q.—So that there is no complete formula agreed upon in connection with this matter of losses since the abandonment of the 1931 schedule, which was Nebraska's Exhibit 88-A?

A.—The 1931 schedule likewise was only the rate of evaporation losses, and this other matter of time interval correction was not covered in 1931.

Q.—You have had no further discussion with Mr. Willis or Mr. Hall since May 27th, 1941, as to what time interval correction shall be used?

A.—I have contacted Mr. Willis' office rather recently regarding a further consideration of the matter.

Q.—That is the correspondence where you wrote him on October 1st, 1941, but aside from that correspondence, you have had no discussion with him as to what was or was not to be used in the season of 1941?

(28000)

A.—That is correct.

Q.—In connection with this time interval correction, you applied such a time interval correction in the so-called run sheets from time to time during the season of 1941?

A.—Yes.

Q.—Sometimes that would be a plus quantity and sometimes a minus quantity?

A.—Yes.

Q.—The purpose of that was to create some kind of a balance and correspondence between your computed run sheets and the actual measurements of the water?

A.—No, it was not for that purpose. The purpose of that was to keep the natural flow at the State line at some reasonable figure in proportion to what was put in at the upper end of the

section. We find that if we knew (use) the straight three-day interval correction, in case of large changes of flow in the river that we get very erratic figures for the natural flow at the State line, and at Whalen. It might come out exact one day and be off a thousand second feet the next.

Q.—And it might come out a minus quantity?

A.—Yes, it might come out a minus quantity, and that is the reason for these corrections, is to try to keep the natural flow at the figure that it would appear should obtain if there was no storage in the river.

Q.—In making this time interval correction, you use your best (28001) judgment, based upon your experience on the river and your observation of what conditions were in the river, and, using that judgment, you arrive at the figure for this time interval correction, do you not?

A.—Yes, it is a more or less arbitrary correction, and that is the particular thing that Mr. Hall has objected to. He would like to have a formula so that it would not depend upon the judgment of somebody, but it could be referred to a formula, and that would be a very desirable thing to do, if it can be worked out.

Q.—But during this season of 1941, you frequently applied this time interval correction in sometimes a plus quantity and sometimes a minus quantity?

A.—That is correct.

Q.—Using your judgment as to how much natural flow you thought ought to have been at the State line at that time, in view of the amount that came in at Alcova a few days earlier?

A.—Yes. For instance, if a change in the flow in the river upset the natural flow that had obtained a few days previously, under what we might refer to as steady flow conditions, and upset it wholly due to a change in the storage flow, this correction was made to bring the figure to figure that had been relative to what it had been under steady flow conditions?

Q.—Bringing the figure to a figure that you felt would be reasonable, in view of all the conditions?

A.—That is correct.

(28002)

Q.—Now, the results of this operation have considerable effect upon the actual operation and the administration of the river under Mr. Willis in the region between the State line and Bridgeport, do they not?

A.—Yes , it is quite important, I believe, from Mr. Willis' standpoint of administration to determine that natural flow figure for all canals that have no storage rights in there and have to be administered upon a priority basis.

Q.—If there is an error in a series of four or five days as to the amount of natural flow in relation to the storage, that might mean that a natural flow canal might get more or might get less than its due allotment of water, isn't that right?

A.—That might be true over a very short period. However, the corrections made which are shown in the work sheets as plus or minus storage in that section of the river are made to balance out in such a way that over the season there is no robbery of natural flow or storage and no particular accrual to it as a result of this method of calculation.

Q.—That is, an attempt is made to balance out, according to your judgment of what ought to be the amount of natural flow and storage at the State line, is that right?

A.—It is not balanced out according to judgment. It is balanced out mathematically.

Q.—But it is balanced out mathematically upon what factors?

A.—Upon the factors of plus and minus channel storage, if you (28003) want to use that term. If we plus storage into the channel some days, we minus the total of the same amount later on to make it balance out.

Q.—That is to say, and you just testified in that way, that your balancing out of these plus and minus quantities that you put in is based upon your judgment of how much natural flow and storage water is at the State line, in view of the conditions and the quantities of natural flow and storage at Alcova?

A.—Yes, that is correct.

Q.—Accordingly, the plus or minus corrections are based upon this matter of judgment.

A.—Yes.

Q.—And the balancing out is based upon this matter of judgment?

A.—I might say that for this year I did at various times attempt a formula—whenever the natural flow was depleted more than about two hundred second feet, I always took enough storage loss or correction to prevent a greater depletion than that, and I have another rule for the time interval which I call the ten-twenty-thirty rule. In case of a change in the river flow,

with an adjustment from hour to hour of a considerable amount, and the time interval is less than three days for the start of the change at Guernsey, I made a correction for the second day of thirty per cent of change of the flow, either plus or minus, depending upon whether an increase or a decrease in the flow was involved, and for the third day a correction of twenty per cent, and the fourth day ten per cent, with the (28004) opposite sign to what was used for the second day. That formula shows some promise of working in these changes, but we don't have enough examples to say definitely that it will work in all cases.

Q.—You didn't use that continuously throughout the season?

A.—I don't believe I did.

Q.—If, as the result of an error on one day which you tried to balance out by a corresponding correction figure on a succeeding day, if a natural flow canal was deprived of natural flow water—

A.—Your question started "as the result of an error." I don't understand what is meant by that.

Q.—I don't mean exactly an error, but as a result of wrong figures due to not making a proper time interval correction. As I understand it, the purpose of the balance figures that you put in afterwards is because, in running the water down to the State line on one day, you have not given quite the correct figure, so you have to balance it by a corresponding plus or minus a few days later, isn't that the way you did it?

A.—The purpose of this correction is to give a more correct figure than would be determined by the straight three-day interval figure. That is the purpose of it.

Q.—You said that Mr. Hall from time to time during the season of 1941 discussed with you this time interval correction?

A.—We may have discussed it over the phone a few times. I don't remember that we had any meeting or conference about it.

Q.—Did he ever see fit to consider this time interval correction (28005) which you applied an accurate correction?

A.—No, I don't think so.

Q.—Did Mr. Willis ever say that, or say that in substance, to you?

A.—No. The matter is still wide open for discussion. They have never agreed to it and neither have I.

Q.—And they never agreed to use the May, 1940, evaporation figures for the season of 1941, have they?

A.—As to the evaporation, I do not find anything later than Mr. Willis' communication of March 20th, 1940.

Q.—You refer to this—"Until further checking has been given this matter, figures of Column 2 will be used"?

A.—Yes, as far as evaporation is concerned, I haven't had anything further from him regarding that phase of it.

Q.—Then, since March, 1940, there have been three experimental schedules, each of them in an attempt to work out something, is that right?

A.—Yes, pertaining to the time interval correction.

Q.—Well, the evaporation figures have been agreed to by Mr. Willis only until further checking has been given, isn't that right?

A.—That is the way the matter stands regarding evaporation, as I understand it.

Q.—And you have an experimental schedule of May 20th, 1940, another one of July 31st, 1940, and then for the season of 1941 you reverted to the May, 1940, schedule of evaporation and applied the (28006) time interval corrections?

A.—As far as evaporation is concerned, I never have departed from it except as it is involved in the plan we used in the latter part of 1940. That plan did not require the use of the evaporation figures directly. We considered them in arriving at the plan—I did, at least.

Q.—In arriving at the formula?

A.—Yes.

Q.—You arrived at a formula which involved the use of the evaporation figures but you did not directly apply the evaporation figures under that formula?

A.—No, not under that formula.

Q.—I believe you stated that at no time did either Mr. Willis or Mr. Hall tell you that Nebraska agreed to reverting to the May, 1940, schedule for the 1941 season?

A.—That is correct.

Q.—Mr. Gleason, there are other elements besides the actual evaporation that enter into the computation of the whole balance of natural flow and storage at the State line, are there not?

A.—Yes.

Q.—You have mentioned this time interval lag?

A.—Yes.

Q.—That is also sometimes called channel storage, is it not?

A.—Yes, I think we have used that term.

Q.—Then, there is what is called bank storage, which means water (28007) which is, we might say, pressed into the dry banks when the river rises, and some of it comes back in a later part of the season, or when the river drops. That is what is called bank storage, is it not?

A.—Yes.

Q.—And then, in addition, there is transpiration from vegetation which is in or immediately adjacent to the channel? That is another element that enters into the conveyance loss between Alcova to the State line?

A.—Yes.

A.—It is generally conceded there are such losses by transpiration, but whether they have any effect upon the carriage of storage water, I rather doubt. Whether the transpiration losses occur whether there is storage in river or not, I wouldn't say. I don't believe that that would make much difference.

Q.—It might make some difference, due to the fact that the carrying of storage water in the river would incerase the quantity of water in the river, and the river thereby may reach some vegetation that the river would not reach if the channel were in its natural state, isn't that correct?

A.—That is probably correct, yes.

Q.—Then, in addition to those elements, there are the matters of tributary inflow between Alcova and Guernsey and the matter of diversions between Alcova and Guernsey?

A.—Yes.

Q.—And those also enter into the picture as to the transmission (28008) losses between Alcova and the State line.

A.—Yes. As I testified yesterday, I believe the main reason that I abandoned this spring the 1940 tentative plan, which worked fairly well for the latter part of the 1940 season under conditions where there was practically no flow in the creeks between Alcova and Guernsey, that formula, as I remember it, provided that the flow in such creeks had to be estimated and added to the quantity that was otherwise determined by this formula. But starting 1941 we had an entirely different situation. All these creeks were carrying water and they carried water all during the season of 1941, and, therefore, it was either necessary to estimate the flow of those creeks, in the absence of

daily reports, which could not be arranged,—daily reports of the gauge heights—or the natural flow users might have been very heavily penalized due to not getting that water, and that was the reason, the primary reason, I did not attepmt to use that 1940 formula this year.

Q.—Now, this whole matter, ever since March of 1940, and right down to the present date, has been in an experimental stage, has it not?

A.—This matter of the time interval correction in the computation of storage water has been in an experimental stage for ten years, as far as I am concerned, and we haven't yet arrived at a formula that will hold up and work.

WYOMING CROSS-EXAMINATION, RECORD PAGES 28021 TO 28029.

(Page 28021)

Q.—I believe you stated that you are the Superintendent of Power for the Bureau of Reclamation?

A.—Yes.

Q.—By virtue of that position, you are the manager of the North Platte project?

A.—Yes.

Q.—How long have you occupied that position?

A.—About eleven years. I think it will be twelve years next February.

Q.—When was the first year that any attempt was made to make any segregation as to the quantity of natural flow and storage arriving either at Guernsey or at the Wyoming-Nebraska line?

A.—This plan adopted in 1931 was the first time, so far as I know, that there was cooperation with the State of Wyoming and the State of Nebraska in attempting to formulate a plan for doing that. That had been a problem to some extent previously, but there never had been much occasion to determine the figure previously, but there never had been much occasion to determine the figure previous to 1931.

Q.—Isn't it a fact, Mr. Gleason, that previous to 1931 no determination of natural flow and storage below Pathfinder reservoir had been used in any way, as far as the operation of the North Platte project was concerned?

A.—I wouldn't be able to say as to what had been done before I arrived on the project in 1930. However, I did, in starting out myself in 1930, begin to study that question, but it was not until

1931 (28022) that we arrived at the cooperative plan that we used for carrying it out.

Q.—In the year 1930 you made no day-to-day determination, did you?

A.—No, I don't think so. There was no allotment of water, and I don't think there was anything done on that in 1930, as I remember.

Q.—When you came to Guernsey and took that position, you didn't find any record in the office indicating that any such determination had been made in any year prior to 1931, did you?

A.—The records did not contain any determination of storage and natural flow, so far as I know.

Q.—Prior to 1931?

A.—Yes.

Q.—You were not located at Guernsey before you took this position of Superintendent of Power?

A.—No, I was not located on the North Platte project previous to that.

Q.—But, as far as you have information on the subject and from what is reflected from the records in your office, no determination was made as to natural flow and storage at Pathfinder and between there and the Wyoming-Nebraska line until 1931?

A.—I don't think there is any record of any such determination. However, there must have been some determination made in previous years, for, otherwise, we would have had no basis for operation and release of water.

(28023)

Q.—Isn't that just a conclusion of yours, Mr. Gleason? If there was an adequate supply at all times, it wouldn't make any difference whether there was any determination or not, isn't that correct?

A.—That is more or less true, but I am incluined to think that the matter had been given consideration in previous years by whoever was handling the releases at Pathfinder. There must have been, but, as I say, there have been no records made showing the separation of the natural flow and storage.

Q.—Well, at least, when you came to that question, and in 1931 found what you considered to be a necessity for making such a determination, you had no schedule or basis for the making of it, did you?

A.—As I remember it, when I first went there I was told by

Mr. Stetson, my predecessor, of a formula that he had used which was based upon releasing of sufficient water to take care of the Warren Act schedules in addition to the strictly Government canals, but I don't remember the formula used or exactly how it worked; but we found that, as water became scarce in 1931, it was necessary to get down a little closer to some actual figures that had been used before when there was plenty of water at all times, and that was the erason for the study we gave the matter starting in 1930 and culminating in this plan that was adopted cooperatively.

Q.—Mr. Gleason, it is a fact, is it not, that until the 1931 plan was adopted, which is reflected in Nebraska Exhibit 88-A, you had no basis for making a determination?

(28024)

A.—I wouldn't say we had no basis. There is always a basis for a determination of some kind.

Q.—At least, none had been agreed upon by the interested parties?

A.—Yes, so far as I know, there had been on agreement between the States about it.

Q.—Mr. Gleason, the problem of making a segregation of natural flow and storage in the North Platte River below Alcova is a very complicated and difficult one, is it not?

A.—Yes, it is quite complicated.

Q.—There are a great many variable factors, are there not?

A.—Yes.

Q.—And conditions change from day to day, of course?

A.—Yes.

Q.—And conditions change even from hour to hour?

A.—Yes, that is true.

Q.—So that, commencing, for instance, at the upper reaches, you first have to make some computations to arrive at the inflow at Seminoe and the inflow between Seminoe and Pathfinder, do you not?

A.—There is a gauging station below each of these three upper dams.

Q.—You spoke of using data on the Medicine Bow River?

A.—Yes.

Q.—And you us data on the Sweetwater River, do you not?

A.—I don't believe I answered your question about three questions back. You asked about computing the inflow of the

reservoir, (28025) if I got you correctly. The method of doing that is to take the measured outflow of the reservoir and correct it each day for the change in storage content as shown by the table and the evaporation loss, and by that method we arrive at the computed inflow of each of those three reservoirs and a record is made of it.

Q.—I am glad you called my attention to the impropriety of my question, Mr. Gleason. What I meant to inquire about was your using the values on the Medicine Bow, and perhaps I did not understand the connection in which you used those values.

A.—Yes. This year we used the actual measured values of those inflows rather than arithmetical combinations of the computed inflows, because we find it gives more consistent figures, because by the time we work water through the reservoirs, with the inevitable errors in the observation of the reservoir elevations, we get some rather fantastic figures by the strictly computation method. It is very easy to read the reservoir water surface in the morning two or three inches too high or too low, or the wind may be blowing the water up near the gauge, and it is to smooth out those computed figures which, for the daily use, became rather erratic, especially now when we have three reservoirs to work the water through, and that is the reason I believe it is better to use actual measured inflows, even though we have to do a little estimating on the small streams.

Q.—Of course, that latter method that you have described is subject to some inaccuracy because of unmeasured flows?

A.—Yes.

(28026)

Q.—Then, below Alcova, of course, there are a number of tributaries that sometimes carry water and sometimes do not between Alcova and Guernsey?

A.—That is correct.

Q.—And the run-off of these tributaries fluctuates quite widely from day to day, doesn't it?

A.—Yes, that is true, and they have storms in there and the flow may be changed very radically in two hours.

Q.—And the rate of evaporation changes from day to day, does it not?

A.—Yes. On the reservoirs, we use the daily evaporation for the daily correction. However, in this formula we have used on the river for evaporation correction, we don't attempt to get

to that refinement. We use the mean monthly figures and we do not attempt to correct the river for daily fluctuations in evaporation.

Q.—That is the point I wanted to bring out—that you use the monthly value based upon a certain period of time in making the day-to-day computation of the natural flow and storage, which does not reflect the actual conditions as they exist from day to day?

A.—That is true.

Q.—There may be a cloudy day, or some rain over the area, when, of course, the evaporation is much lower than it would be in your monthly average, that is true, isn't it?

A.—It might be either lower or higher.

Q.—If that period of cloudiness and rain continued for perhaps (28027) a week, or several days, the monthly value, the actual value, might be very seriously affected as compared with the overall average that you use?

A.—I doubt if the word "seriously" should apply. I don't think that the differences would be sufficiet to attempt to use daily figures on the river. At least, that has always been my impression. The computations are now becoming so burdensome that it takes a great deal of time to make these computations, and that would simply add another detail that we had to determine each day. My personal opinion is that it is not worth while to go into that.

Q.—It is a fact, is it not, for the 1931-1939 period, inclusive, you used the evaporation rate which historically occurred in the 1921-1930 period?

A.—Yes, that is correct.

Q.—Now, as a matter of fact, Mr. Gleason, the evaporation rates were actually much higher, were they not, in the 1931-1939 period on account of the higher temperatures and smaller precipitation than was the case in the 1921-1930 period?

A.—Yes, evaporation was slightly higher in the later period.

Q.—You say "slightly." You don't have any figures indicating just the extent, do you, in inches—the difference in inches?

A.—No, I don't have the figures with me, but they are available.

Q.—Yes, they may be available in the record in this case in some of the exhibits.

A.—However, of course, during the same period we are using

this (28028) area of river surface that we found by a later survey was apparently very excessive, so it would more than offset the other effect due to the evaporation figure being low.

Q.—But, giving consideration to all of these factors, there isn't any way of making any accurate determination, day to day, of the actual balance of natural flow and storage at either Guernsey or the Nebraska-Wyoming line, is there?

A.—That term "accurate" depends upon what is accurate.

Q.—I mean this, Mr. Gleason—if there is 5,000 second feet of water arriving at Guernsey, is there any way that you can correctly and accurately determine that 2,500 for instance, is storage and that 2,500 is natural flow?

A.—Oh, I believe that we arrive at a figure that is correct enough for administrative purposes. It must be realized that an error of ten second feet in five hundred is inevitable. All hydrographic records are inaccurate to a varying extent, and the computations based upon them, and based upon assumptions as to evaporation in preparing formulae, so the judgment of the men doing it enters into the final figure, and the most we can hope to do is to arrive at daily figures which, summed up over a period of time, will more closely approximate the accurate figures than the daily figures taken individually do.

Q.—Do you think there might be an error of ten second feet in five hundred second feet?

A.—I would be surprised if you came that close.

(28029)

Q.—If there were five thousand second feet, the error would be on the same basis, or one hundred second feet?

A.—The only trouble in attempting to determine the error is that you have no standard to compare with. Somebody else might figure it and say that you are in error, but has he based his figures upon the same ones that were used by the same man?

Q.—Well, Mr. Gleason, as a matter of fact, after ten years' experience, as your testimony indicates, you haven't found any satisfactory way of making this determination?

A.—Not entirely satisfactory. We haven't found any rigid formula that would fit.

Q.—Of course, you hope to find something in the future, but only the future can tell whether you will find any satisfactory way or not?

A.—That is correct.

Q.—And, in any event, assuming that it could be done, it is a very laborious and difficult task, is it not?

A.—Well, there is considerable work involved and it is becoming more burdensome with the additional reservoirs.

Q.—And the operation of the Kendrick project will probably add some additional complications, will it not? That is, it will divert from the Alcova reservoir, and there will be questions of return flows and problems of that kind that will further complicate the situation?

A.—Very likely.

U. S. EXHIBIT No. 204-A

Sheet 1

Bridgeport, Nebraska
March 20, 1940

TABULATION OF RIVER AREA BETWEEN SEMINOE RESERVOIR IN WYOMING AND THE WYOMING-NEBRASKA LINE AS PREPARED BY SEVERAL INDIVIDUALS AS FOLLOWS:

Sections	(1)	(2)	(3)	(4)
Seminoe Reservoir (full)				
Pathfinder Dam to Guernsey Dam	16,700			
Pathfinder Dam to backwater Alcova Reservoir		190	190	190
River Section Alcova Reservoir		240		
Alcova Dam to Backwater Guernsey Reservoir		8,360	8,360	9,090
Guernsey Reservoir (full)		2,300		
Guernsey Dam to Whalen Dam	1,000	560	562	520
Whalen Dam to State Line	6,000	2,430	2,432	2,560
Totals	23,700	14,080	11,544	12,360

First Column represents area tentatively agreed upon by State Engineer Whiting of Wyoming, C. F. Gleason, Supt. of Power, U. S. Bureau of Reclamation, and R. H. Willis, Chief of the Bureau of Irrigation of Nebraska, in May, 1931. Abandoned March, 1940.

Second Column submitted by C. F. Gleason, computed from aerial survey maps.

Third Column from testimony in Wyo-Nebr. case by Mr. Keimig.

Fourth Column computed from aerial survey maps, borrowed from C. F. Gleason, by N. S. Dodd.

Letter file contains references to the areas tabulated and the figures show discrepancies that are not accounted for on this date. Until further checking has been given this matter, figures of Column Two will be used.

(Sgd.) R. H. WILLIS,
R. H. Willis, Chief, Bureau of Irrigation, Water Power and Drainage.

U. S. EXHIBIT No. 204-A
Sheet 2

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Guernsey, Wyoming

May 20, 1940.

Mr. R. H. Willis, Chief,
Bureau of Irrigation, Water Power and Drainage,
State of Nebraska,
Bridgeport, Neb.

Dear Mr. Willis:

Enclosed herewith are new instructions for computing reservoir evaporation losses and river carriage losses that have been prepared for this season.

No change is proposed in the method previously used except as follows:

(a) The evaporation for Guernsey reservoir will be separately computed in the same manner as for the other reservoirs.

(b) For river carriage evaporation losses the average Pathfinder evaporation for the period 1921 to 1939, inclusive, is proposed as a basis instead of 1921 to 1930.

(c) The area of water surface of the different river sections is based upon the aerial photographs made in 1939 and previous years.

These instructions are satisfactory to the Chief Engineer, Bureau of Reclamation and are being submitted to the State Engineer of Wyoming for his consideration. Your comments will be appreciated.

Very truly yours,
(Sgd). C. F. GLEASON,
Superintendent of Power.

Encl.
CC—Commissioner No Encl.
Chief Engineer No Encl.
D. C., Billings No Encl.

Same letter addressed to Mr. L. C. Bishop, State Engineer of Wyoming, Cheyenne, Wyo.

U. S. EXHIBIT No. 204-A
Sheet 3

U. S. BUREAU OF RECLAMATION
NORTH PLATTE PROJECT
BASIS FOR COMPUTING RESERVOIR EVAPORATION LOSSES AND RIVER CARRIAGE LOSSES ON STORAGE WATER SEASON OF 1940

Reservoir Evaporation Losses

Seminoe, Pathfinder and Alcova Reservoirs

Evaporation will be computed daily based upon evaporation from Weather Bureau Standard 4-foot diameter Class "A" pan located at Pathfinder reservoir. Daily evaporation will be multiplied by area of water surface of reservoir in acres and by co-efficient of 70% to reduce pan record to open water surface.

Guernsey Reservoir

Compute same as above except use pan evaporation at Whalen Dam.

River Carriage Losses

River carriage losses will be computed upon basis of area of river water surface as determined by aerial surveys made in 1939 and previous years and upon average monthly evaporation at Pathfinder reservoir for the period 1921 to 1939, inclusive, using a co-efficient of 70% to reduce pan records to open water surface.

Daily evaporation losses in second-feet for various sections of the river is shown in the following table:

River Section	Table Area Acres	Daily Loss—Sec.-ft. May	June	July	Aug.	Sept.
Alcova to Wendover	8360	53	76	87	76	56
Guernsey Res. to Whalen ..	560	4	5	6	5	4
Whalen to State Line	2430	16	22	25	22	16

Above table is based upon mean evaporation at Pathfinder as follows: May .561 ft; June .767 ft; July .910 ft; Aug. .799 ft; Sept. .568 ft. Co-efficient of 70% to reduce pan record to open water surface.

Above table does not contain computed loss for section of river from Pathfinder dam to head of Alcova reservoir (area 170 acres) because this area is less than submerged area of original river bed in Alcova reservoir and is, therefore, considered as off-set.

Sheet 4

Likewise the area between Seminoe dam and head of Pathfinder reservoir is less than area of original river bed through Pathfinder reservoir—considered as off-set. Evaporation losses will be divided between natural flow and storage water flowing in any section of river channel upon a proportional basis. This proportion will ordinarily be determined at the upper end of the section except under conditions of intervening accruals or diversions that materially change the ratio of storage to natural flow at the lower end of the section. In such event the average proportion for the section will be determined by using the mean ratio for the two ends of the section.

U. S. EXHIBIT No. 204-A
Sheet 5

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Guernsey, Wyoming

May 20, 1940.

Mr. L. C. Bishop,
State Engineer,
State of Wyoming,
Cheyenne, Wyo.

Dear Mr. Bishop:

Enclosed herewith are new instructions for computing reservoir evaporation losses and river carriage losses that have been prepared for use this season.

No change is proposed in the method previously used except as follows:

(a) The evaporation for Guernsey reservoir will be separately computed in the same manner as for the other reservoirs.

(b) For river carriage evaporation losses the average Pathfinder evaporation for the period 1921 to 1939, inclusive, is proposed as a basis instead of 1921 to 1930.

(c) The area of water surface of the different river sections is based upon the aerial photographs made in 1939 and previous years.

These instructions are satisfactory to the Chief Engineer, Bureau of Reclamation and are being submitted to Mr. R. H. Willis for his consideration. Your comments will be appreciated.

Very truly yours,
(Sgd.) C. F. GLEASON,
Superintendent of Power.

Encl.
CC—Commissioner No Encl.
Chief Engineer No Encl.
D. C., Billings. No. Encl.

Same letter to Mr. R. H. Willis, Bridgeport, Neb.

U. S. EXHIBIT No. 204-A
Sheet 6

STATE OF WYOMING
State Engineer's Office
Cheyenne

May 29, 1940

Mr. C. F. Gleason,
Superintendent of Power,
Guernsey, Wyoming.

Dear Mr. Gleason:

I hope you will pardon my delay in making reply to your letter of May 20, 1940, relative to computation of river losses, which I find at hand upon my return from the western part of the state.

The changes proposed appear to be reasonable and are acceptable to this office.

Yours very truly,
(Sgd.) L. C. Bishop,
L. C. BISHOP,
State Engineer.

EXCERPT FROM UNITED STATES EXHIBIT No. 266 SHOWING DIVERSIONS FOR LINGLE AND HILL IRRIGATION DISTRICTS UNDER THE INTERSTATE CANAL FOR THE YEARS 1930 to 1933 inclusive and 1937 to 1939, Inclusive

Year	Acre Feet
1930	42,986
1931	37,755
1932	46,159
1933	39,780
1937	46,930
1938	44,890
1939	48,360

U. S. EXHIBIT No. 265

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
WASHINGTON, NOV. 6, 1941

Office of the Commissioner
The Secretary
of the Interior.

Sir:

By reason of recent experience in the operation of the North Platte Project on the North Platte River in Wyoming and Nebraska and also by reason of the recent completion of the Seminoe and Alcova Reservoirs on that river and the current construction of the Kendrick Project, it seems desirable that I recommend to you at this time a method of operation of the reservoirs constructed by the Bureau of Reclamation on the North Platte River. In working out a plan to recommend, the Bureau has sought to conceive a method of operation which will utilize the available waters of the river to the geratest possible extent both for irrigation and for the development of power. Pursuant to the responsibility imposed on you by the Reclamation Act, primary consideration has of course been given to the conservation of water for irrigation purposes. It so happens that that obpective can be achieved without prejudice to the beneficial use of water for the generation of power also.

The Seminoe Reservoir, with its large power plant, is located but a short distance upstream on the North Platte River from the Pathfinder Reservoir. Those reservoirs are of approximately equal capacity, each being capable of storing slightly in excess of one million acre feet of water. To secure the maximum utilization of these facilities I recommend that all water which can be captured in the Seminoe Reservoir, to the extent of its capacity, be held in that reservoir and be released for the generation of power as needed, the water subsequently being recaptured in the Pathfinder Reservoir to the extent of its available capacity. Under such a plan irrigation demands will be met by the release of water from the Pathfinder Reservoir and, to the extent necessary if any, by additional releases from the Seminoe Reservoir and through the Seminoe power

plant. The first call on water for irrigation will be against the waters physically captured in the Pathfinder Reservoir. In this method of operation it is also recommended that the Seminoe Reservoir never be drawn down below 55,000 acre feet, the amount necessary to be held in that reservoir for the maintenance of an adequate head for the generation of power. I am satisfied that this 55,000 acre feet of water can be withheld in the Seminoe Reservoir without appreciable effect on the irrigation supply. Likewise it is recommended that Pathfinder Reservoir never be drawn down below 5,000 acre feet. This limitation is desirable from an administrative standpoint and for the preservation of fish life in the reservoir.

The Alcova Reservoir lies about eight miles down stream from the Pathfinder and has a total capacity of approximately 190,000 acre feet. Of this total capacity approximately 176,000 acre feet must be filled to make possible a diversion of water for the Kendrick Project through the Casper Canal which has its headworks at the reservoir and at an elevation above the natural bed of the stream. In these circumstances it is recommended that, when irrigation on the Kendrick Project is commenced, the Alcova Reservoir be kept filled to the minimum extent of 176,000 acre feet, or to the extent necessary to allow diversion through the Casper Canal. The remainder of the capacity of the reservoir will be utilized to the fullest extent possible for the conservation of waters which cannot be captured or held in Seminoe and Pathfinder. After irrigation of the Kendrick Project is commenced, the Alcova Reservoir will be drawn down below the 176,000 acre-feet level only in either of two circumstances: (1) when the irrigation seaeson for the Kendrick Project has closed in the fall prior to the closing of the season on the lands of the North Platte Project down stream at lower elevations in which case the requirements of those lower lands may be met from Alcova Reservoir; (2) when the available irrigation water in the Seminoe and Pathfinder reservoirs is exhausted.

The Guernsey Reservoir is a storage and regulating reservoir of approximately 50,000 acre feet capacity lying about one hundred fifty miles down stream from the Alcova Reservoir and lying shortly above the point of diversion of the two main canals serving the North Platte Project One of the main canals of the Project, the Interstate Canal, serves an off-channel reservoir known as Lake Minatare which has a capacity of approxi-

mately 60,000 acre feet and which is so located that it serves as a supplemental source of supply for a large acreage of project lands. During the severe portion of the water season water cannot be run to the Lake Minatare Reservoir because of ice conditions on the Interstate Canal. Consequently storage in that reservoir must be accomplished during fall and spring months.

For the greatest conservation of water for irrigation purposes it is recommended that all water available at Guernsey Reservoir between October 1 and November 15 of each year be run through the Interstate Canal into Lake Minatare to the fullest extent possible. On or shortly after November 15 the Interstate Canal becomes unusable for the remainder of the cold weather. From then until April Guernsey Reservoir will store water to the fullest extent possible. During April as much water as possible which has been stored in Guernsey Reservoir during the winter will be run through the Interstate Canal to fill any remaining capacity in Lake Minatare and also to fill Lake Alice, another small off-channel reservoir fed by the Interstate Canal. This April run of water will be to the full extent of the remaining capacity in Lake Minatare and also the capacity of Lake Alice. Guernsey Reservoir will then be used to capture as much of the spring-run-off as its capacity will permit.

The plan outlined in the preceding paragraph is, of course, dependent on the operation of Guernsey Reservoir in such a manner as to make possible the capture by it and utilization of the maximum amounts of water. To make this plan fully effective the maximum possible amount of storage capacity must be available in this reservoir on October 1, the end of the irrigation season. Consequently it is also recommended that Guernsey Reservoir be used for the satisfaction of late irrigation season demands to the fullest extent possible and that, as a result of that operation, Guernsey Reservoir be pulled down to not more than 5,000 acre feet of water as of October 1 of each year.

This proposed plan of operation has been given careful and extensive consideration by operating and supervisory personnel of the Bureau and by me. I am convinced that it presents the method of operation best calculated to conserve and utilize the waters of the North Platte River available for use under the Reclamation program. It is, of course, specifically recognized that the proposed plan of operation may be altered, in your dis-

cretion, if, in the future, changed circumstances which are not presently foreseeable require and warrant a change in the plan of operation.

I recommend this plan for your consideration and request that, if you approve it, you so signify by notation on this letter.

Respectfully,

Approved: NOV. 10, 1941 (Sgd.) H. W. Bashore
(Sgd.) John J. Dempsey Acting Commissioner.
Acting Secretary of the Interior.

INTRODUCTION OF UNITED STATES EXHIBIT NO. 265 BY MR. KIRGIS, COUNSEL FOR THE UNITED STATES

Record Pages 28597 and 28598

(28597)

MR. KIRGIS: There is now being distributed a document which has been marked for identification as United States Exhibit 265. This will not be offered in the usual manner, through the result of testimony given by a witness. There are certified copies of this document, and each of you, I believe, has been given at least one certified copy of the document.

This is a letter to the Secretary of the Interior from the Acting Commissioner of the Bureau of Reclamation, and approved, as noted in the lower left-hand corner of Page 3, by John J. Dempsey, Acting Secretary of the Interior, on November 10, 1941. This document prescribes a method of reservoir operation for the reservoirs of the Bureau of Reclamation on the North Platte River.

It is offered in evidence as proof of the action taken by the Secretary of the Interior in prescribing a method of reservoir operation to be followed. It also, as will be brought out (28598) later, constitutes a background for the method of reservoir operation adopted by this witness who is now on the stand in his water supply study.

Inasmuch as this is a certified copy of an official record of the United States Department of the Interior, on file in that Department in Washington, it is, I believe, admissible in evidence, and I offer in evidence United States Exhibit 265.

TESTIMONY OF BARRY DIBBLE, WITNESS FOR THE UNITED STATES CONCERNING POOLING OF RESERVOIR SUPPLIES IN THE UNITED STATES WATER SUPPLY STUDY

Record pages 29083, 29086

(29083)

Q.—As we understand the plan of operation, water may be temporarily (29084) detained in Seminoe for the purpose of creating a power head and fed out more slowly into Pathfinder, but that would be treated as Pathfinder water until the Pathfinder capacity was satisfied?

A.—You mean on the priority basis?

Q.—Yes, on the priority basis.

A.—I presume that is correct.

Q.—Now, in some years, upon an operation table operating the reservoirs on that priority, there would be no Seminoe water at all, isn't that right?

A.—Well, we carried through a study of that kind a number of years back—that was the first study we made—and we found that the first project to run out of water was the North Platte project, in 1934.

Q.—But in years subsequent to that—of course, the Seminoe would run out of water soon after that, would it not?

A.—No, it continued along until 1939 or 1940, I think.

Q.—Did that take account of the priorities of other projects down below, and their demands?

A.—Yes.

Q.—The Seminoe water, however, according to your plan of operation, is to be used indiscriminately with Pathfinder, for the purpose of supplying the projects down to the State line?

A.—That is the way we have made our computation. We haven't attempted to distinguish it.

Q.—You haven't attempted to distinguish it?

(29085)

A.—Just to determine what water is available.

Q.—You did not complete those studies which you said you started on the other basis?

A.—Yes, we carried them through to conclusion.

Q.—In that study, did you supply Pathfinder water indiscriminately to the projects between Alcova and the State line, regardless of whether they had storage rights or not?

A.—My recollection is not clear on that particular point, but I think they were allowed in the study the water they took historically. I think we were not able to distinguish that water—we did not attempt to do so.

Q.—It would make some difference, would it not, if you put them on that basis?

A.—It would make a relatively small difference. The relative quantities of water that are involved are so much larger for the North Platte project, the effect up above is not greatly material. Of course, there would be some effect. Even in that case, if my memory is clear on the subject, I recall we started out with the assumption, after one or two trials to see how it worked, that we only allowed the North Platte Project, after water became short, after the reservoirs ceased spilling, to use 75 per cent of what they used during the period of 1931, 1932 and 1933, and that even with that cut, the North Platte project, depending on Seminoe alone, ran out of water in 1933.

Q.—You mean depending upon Pathfinder alone?

(29086)

A.—Depending on Pathfinder alone, ran out of water in much the same way in 1934 that they did historically—the same effect occurred in the period of record.

Gauging Station in Section 4-23-58W.
at Wyoming-Nebraska Line
Data from Nebr. Reports.

WYOMING EXHIBIT No. 150
1941

NORTH PLATTE RIVER
SPRING CREEK

Acre Feet

Year	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Year	Oct.-Apr.	May-Sept.
1930															
1931															
1932	615	595	615	615	575	645	595	647	526	555	645	625	7253	4255	2998
1933	676	704	661	676	611	694	617	676	595	553	565	635	7663	4639	3024
1934	788	655	615	528	500	666	595	553	516	492	553	595	7006	4297	2709
1935	615	536	522	553	555	593	549	619	655	655	615	595	7062	3923	3139
1936	615	595	593	534	645	613	490	444	464	214	194	198	5599	4085	1514
1937	603	535	492	512	484	492	476	464	500	668	524	522	6272	3594	2678
1938	595	557	565	579	555	583	567	803	708	657	575	740	7484	4001	3483
1939	551	718	684	712	587	609	607	520	956	744	702	569	7959	4468	3491
1940	583	1061	492	492	460	522	516	603	573	508	468	506	6784	4126	2658
Average	621	662	582	578	552	602	557	592	610	561	538	554	7009	4154	2855

Note: Due to incomplete record this Return Flow stream, entering Nebraska from Wyoming a short distance north of the main gauging station on the North Platte River, was omitted from Wyoming Exs. 86 to 95 and from later exhibits. This run-off enters the river above the Tri-State Canal head gate. The amount of run-off is to be added to Return Flow between Whalen and the Nebraska Line. In the Return Flow between Nebr. Line and Bridgeport the amount of water would show up as a channel accretion in the flows in the exhibits and is not to be added thereto. The amount of run-off should also be added as the inflow from Wyoming to Nebraska at the State Line. It has not been added in the Exhibits.

EXCERPT FROM UNITED STATES EXHIBIT 261, SHOWING REQUIREMENT OF THE FIRST UNIT OF 35,000 ACRES OF THE KENDRICK PROJECT

	Acre Feet
May	10,900
June	19,300
July	29,200
August	29,100
September	16,500
Year	105,000

TESTIMONY OF BARRY DIBBLE, WITNESS FOR THE UNITED STATES CONCERNING WINTER DIVERSIONS OF 73,000 ACRE FEET TO THE INLAND RESERVOIRS, LAKES ALICE AND MINATARE OF THE PATHFINDER IRRIGATION DISTRICT

Record pages 28696, 28698

(28696)

Q.—Will you refer, then, to Column 44, which is headed "Diversion at Whalen to Lakes Alice and Minatare," and will you explain the meaning of that heading and the derivation of the values of that (28697) column?

A.—Under the rules derived from United States Exhibit 265, water is run into the storage in the off-stream reservoirs, Lake Alice and Lake Minatare, during October and November of each year, and then in April, to complete the filling of the reservoirs. Such water is taken from the river during October and the first half of November as is available. During April the filling of the reservoirs is completed, and it is assumed that 73,000 acre feet will be used each year in that manner. These are the figures which are shown in Column 44, and entitled "Diversion at Whalen to Lakes Alice and Minatare."

Lake Minatare reservoir is very tight and very little seepage from it. Lake Alice leaks considerably. Therefore, it is assumed here that the water will be put into Lake Minatare that is held over the winter, and that Lake Alice will not be used

until the last thing, that is, the last water that goes down will be put in there. It will be noted in each year, under Column 44, that a total of 73,000 acre feet will be transmitted or diverted for those reservoirs.

Q.—Mr. Dibble, you stated a moment ago that it is assumed that 73,000 acre feet is the annual quantity diverted for those reservoirs. What is the basis of that assumption?

A.—That is based upon the quantity of water which it is estimated can be used from these reservoirs. Perhaps I had better put it in this way—it is the quantity of water necessary to supply the amount of water that would be used annually from the reservoirs in figuring the lands which are subject to irrigation from them or (28698) which are under them.

TESTIMONY CONCERNING SHORTAGE AS AN INHERENT FEATURE OF IRRIGATION DEVELOPMENT

Testimony of Mr. Patterson, Witness for Colorado,
Record pages 24304, 24305

(24304)

Q.—There isn't, as far as you know, any system of human operation of irrigation facilities that could meet varying climatic conditions with 100 per cent efficiency?

A.—No, that can't be done. I think we can go one step farther. We have heard of a situation involving a few days change that can unexpectedly occur in such a short period of time; that is to say, you may have a flood which would join with your released reservoir water and cause a waste of both. But there is the other element, the uncertainty of these more or less climatic cycles, not that they are of any fixed length, but they do occur; that is, there are plentiful years and there are short years, and there are favorable cycles and unfavorable cycles. And so far as I know, there is no one that has yet—science hasn't advanced far enough to predict far enough in advance to prevent drought or shortage from being an inherent feature of irrigation development. In the early days we thought irrigation would avoid the uncertainties of rainfall, and to some extent, of course, it does. But when you get down to talking about an entire stream basin and get to the stage of considering its ultimate development, you start from the fundamental consideration that it is in the public interest to put all this water to use.

(24805)

If on a stream basin we should determine the quantity during a period of drought or deficiency, and should devise works to use that quantity of water, then it would necessarily follow in all more favorable seasons that all of the surplus over that amount might be wasted On the other hand, if you devise your works for a very favorable water supply or have a supply based on a record of a few favorable seasons, then you have created a shortage condition that is adverse to the interests of that basin. So there must be a happy medium, the objective being to have shortages in water supply that are tolerated, and are more or less balanced off by the quantities that will be wasted during cycles of more favorable water production.

Q.—If, for instance, you had an irrigation system devised to deliver a complete supply under unusual drought conditions, then in other seasons you would have a considerable supply of water that would not be used.

A.—That is right.

Q.—And the development of the irrigated acreage would be substantially less?

A.—Yes, development would be halted before it had progressed to a point that is desirable from the standpoint of making as much use as possible of these available resources.

Testimony of United States Witness, Barry Dibble, Record pages 28764, 28765

Q.—Now, from your examination of the records regarding the water supply in the North Platte and Platte Rivers, and from your experience generally, have you formed an opinion concerning the prospects for future supply in this area?

A.—Yes, I have.

Q.—Will you state that opinion and the reasons for it?

A.—It is my opinion that the period 1930 to 1940 represents as low a water supply period as it is wise to prepare for or to construct for in the history of the North Platte River.

Q.—Now, based upon that opinion, what is your judgment regarding the propriety of the use of the historical period 1925 to 1940 in your water study?

A.—I believe, in following it through that period, the studies show that the supply can be made adequate for the entire period by conserving the water in the early years of the period

and using it properly during the later years. It is my opinion that that is the proper basis on which to determine the limit of the water supply on the North Platte River.

Q.—How do you reconcile that opinion with the fact that in your study there are occasional months in which you do not find a supply adequate to meet the requirements which you have placed on the river and found on the river?

(28765)

A—It is not economically sound to develop a river of this kind and entirely eliminate shortages. Irrigation propjects are not made infeasible because of occasional shortages in the water supply, and it is not economically sound to so plan that there will be no shortage at all.

Q.—Do you consider that the shortages which develop in your study are shortages that are not serious to the river itself and its needs?

A.—No, they are not serious to the river and not serious to the projects.

Q.—Now, considering your study, and based upon your experience in reclamation and irrigation matters, is there, in your opinion, any excess water not reasonably required for the Kendrick Project and existing irrigation developments, which could properly be used in new developments on the North Platte River?

A.—Yes, it is my opinion that there is.

Q.—Upon what do you base that opinion?

A.—This study shows that a considerable amount of water was spilled under the plan in 1928, 1929 and 1930, and later years, and if that water—water which would have been available in years of ample water supply prior to the 1925 year, when we started the study, as of September 30th, 1925—if it had been conserved economically, it would be available for other projects.

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1944

No. 6 Original

THE STATE OF NEBRASKA, COMPLAINANT,

vs.

THE STATE OF WYOMING, DEFENDANT.

and

THE STATE OF COLORADO, IMPLEADED DEFENDANT,

THE UNITED STATES OF AMERICA, INTERVENOR.

APPENDIX TO BRIEF OF THE STATE OF COLORADO, IMPLEADED DEFENDANT.

STATEMENT.

In this Appendix Colorado has reproduced from the record certain maps and graphs. Short statements are quoted verbatim from other exhibits. Excerpts from the testimony of some of the witnesses are presented by exact copies from the record of such portions as are thought necessary to an understanding of each particular quotation. The purpose is to amplify rather than contradict specific fact findings made by the Master.

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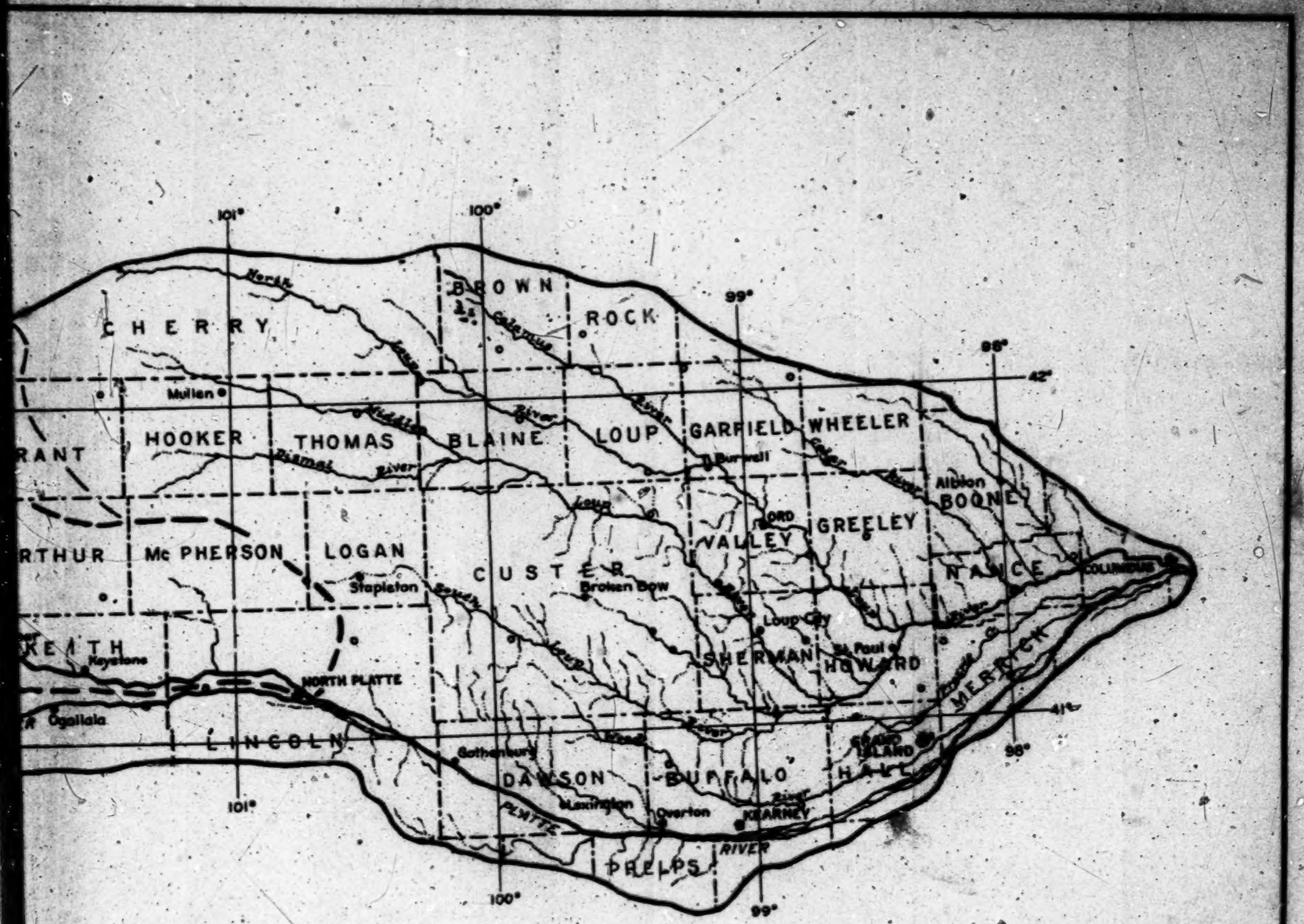
CASPER
NATRONA
CONVERSE
Douglas
Alcova
Pathfinder
Reservoir
Seminoe
Reservoir
CARBON
SWEETWATER
GREAT DIVIDE BASIN
Rawlins
Rock River
Medicine Bow
ALBANY
LARAMIE
Chugwater
Creek
Kimball
CHEYENNE
Sidney
DEUEL
KIMBALL
WYOMING
NEBRASKA
COLORADO
Guernsey Res.
Guernsey
Reservoir
Wheatland Res. #2
Wheatland
Torrington
Henry
GOSHEN
SIOUX
BOX BUTTE
Alliance
SHERIDAN
Mitchell
Scottsbluff
SCOTTS BLUFF
MORRILL
Bridgeport
Pumpkin
Creek
PLATTE
RIVER
GARDEN
Lisco
Oshkosh
BANNER
GRANT
HOOKER
ARTHUR
Mc PHERSON
KEITH
Ogallala
Julesburg
SEDGWICK
PLATTE
CHERRY
Merriman
Valentine
Niobrara
River
Niobrara
Scale
Miles
LARIMER
Fort Collins
Loveland
Longmont
WELD
Platte
GREELEY
Fort Morgan
MORGAN
BOULDER
Boulder
ADAMS
DENVER
ARAPAHOE
CLEAR CREEK
Castle Rock
DOUGLAS
ELBERT
COLORADO
NEBRASKA
KANSAS



BRASKA
ANSAS

GENERAL INDEX MAP

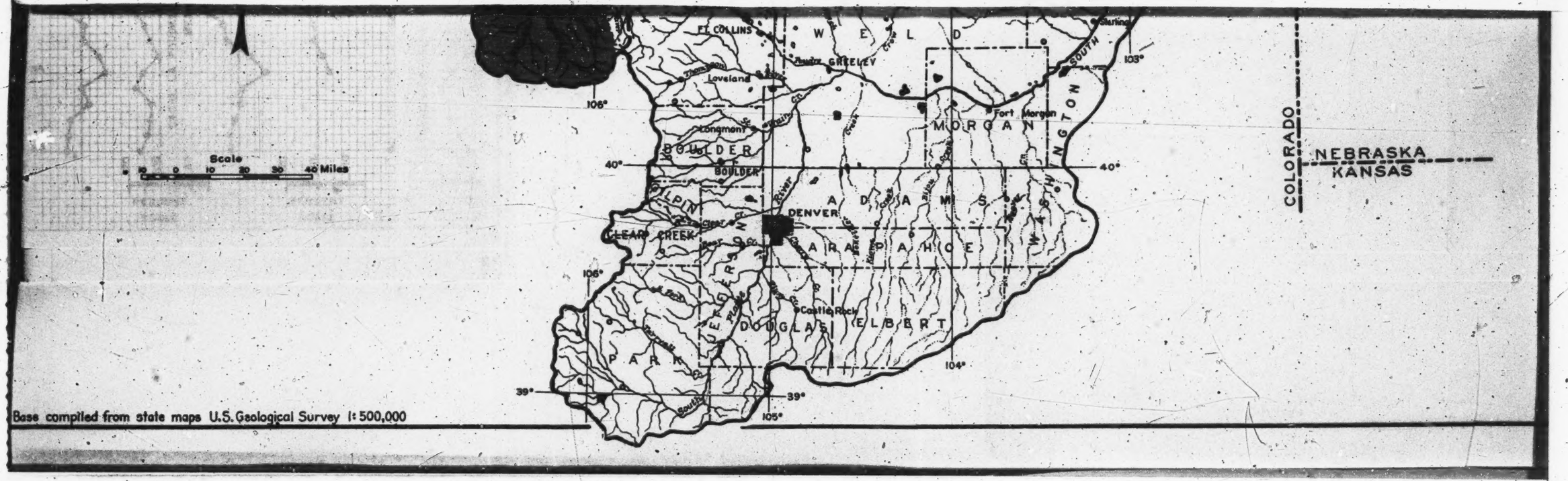
PLATTE RIVER BASIN

PREPARED BY

COLORADO WATER CONSERVATION BOARD

ENGINEERING DEPARTMENT

C. L. Patterson, Chief Engineer


Scale
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Base compiled from state maps U.S. Geological Survey 1:500,000
FT. COLLINS
GREELEY
Loveland
Longmont
BOULDER
DENVER
CLEAR CREEK
Castle Rock
WELD
MORGAN
ADAMS
ARAPAHOE
DOUGLAS
ELBERT
PARK
GILPIN
Fort Morgan
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106°
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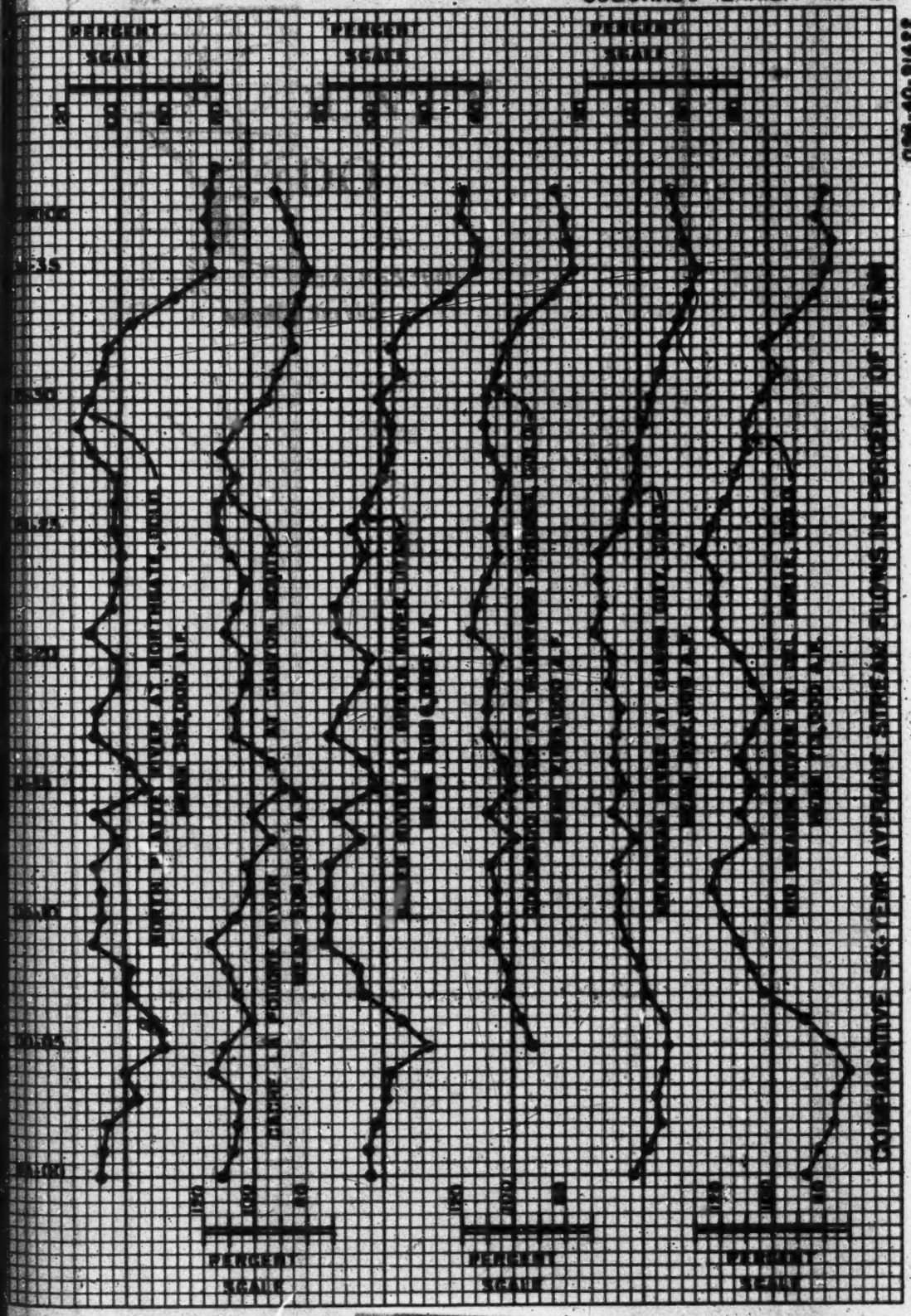
COLORADO
NEBRASKA
KANSAS

COLORADO EXHIBIT No. 28



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GENERAL INDEX MAP

PLATTE RIVER BASIN

PREPARED BY

COLORADO WATER CONSERVATION BOARD

ENGINEERING DEPARTMENT

C. L. Patterson, Chief Engineer

October 1938

100-38-9231

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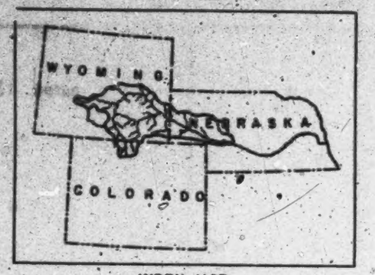

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NORTH PLATTE RIVER BASIN

NORTH PLATTE RIVE

VALUES IN SQUARE MILES

DESCRIPTION	COLORA
ABOVE NORTHGATE, COLORADO TO SARATOGA, WYOMING	190
ABOVE SARATOGA, WYOMING TO ABOVE PATHFINDER RESERVOIR	-
ABOVE PATHFINDER RESERVOIR TO PATHFINDER DAM	-
ABOVE PATHFINDER DAM TO WHALEN, WYOMING	-
ABOVE WHALEN, WYOMING TO BRIDGEPORT, NEBRASKA	400(i)
ABOVE BRIDGEPORT, NEBRASKA TO NORTH PLATTE, NEBRASKA	-
ABOVE NORTH PLATTE, NEBRASKA	

NOTE: DRAINAGE AREAS PLANIMETERED BY COLORADO WA
(a) AERIAL PLANIMETRIC MAPS (U.S. FOREST SERV
(b) U.S.GEOLOGICAL SURVEY STATE BASE MAPS (S
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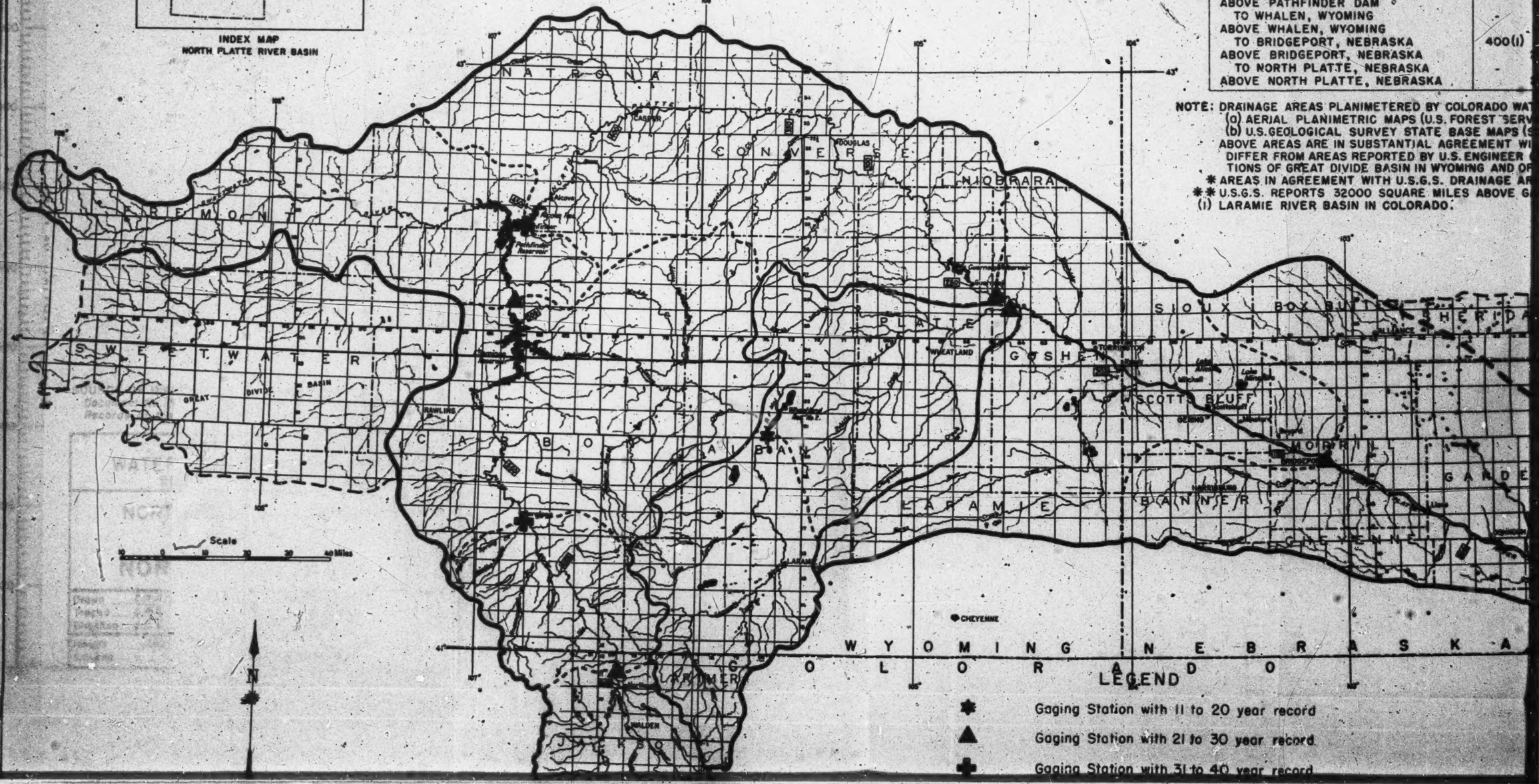
(i) LARAMIE RIVER BASIN IN COLORADO.



LEGEND

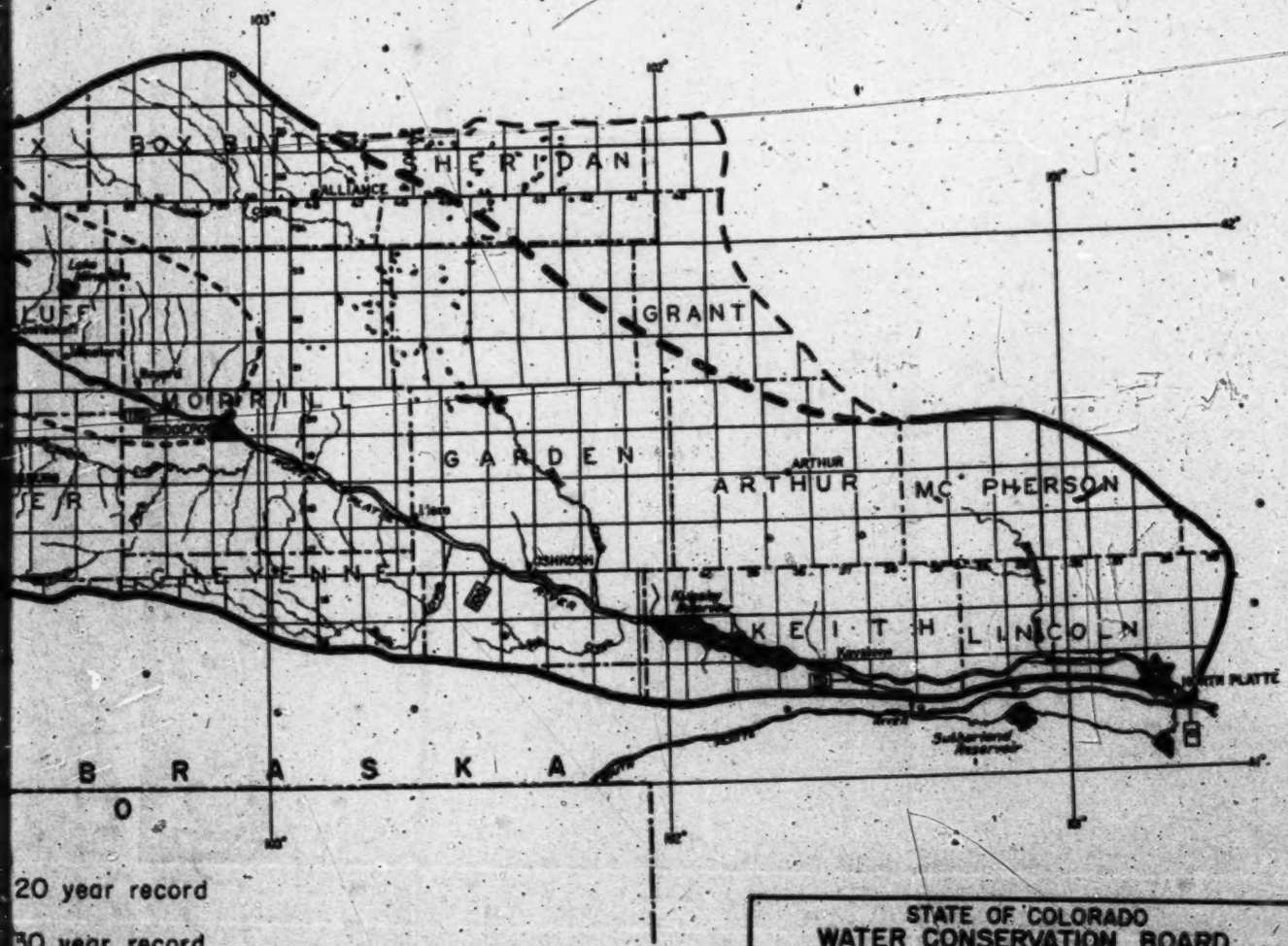
- Gaging Station with 11 to 20 year record
- Gaging Station with 21 to 30 year record
- Gaging Station with 31 to 40 year record

NORTH PLATTE RIVER BASIN DRAINAGE AREAS

VALUES IN SQUARE MILES

DESCRIPTION	COLORADO (a)	WYOMING (b)	NEBRASKA (b)	TOTALS
ABOVE NORTHGATE, COLORADO	1440	-	-	1440 *
TO SARATOGA, WYOMING	190	1250	-	1440
ABOVE SARATOGA, WYOMING	1630	1250	-	2880 *
TO ABOVE PATHFINDER RESERVOIR	-	4530	-	4530
ABOVE PATHFINDER RESERVOIR	1630	5780	-	7410 *
TO PATHFINDER DAM	-	3290	-	3290
ABOVE PATHFINDER DAM	1630	9070	-	10700 *
TO WHALEN, WYOMING	-	5600	-	5600
ABOVE WHALEN, WYOMING	1630	14670	-	16300 *
TO BRIDGEPORT, NEBRASKA	400(1)	7070	1530	9000
ABOVE BRIDGEPORT, NEBRASKA	2030	21740	1530	25300 *
TO NORTH PLATTE, NEBRASKA	-	-	7200	7200
ABOVE NORTH PLATTE, NEBRASKA	2030	21740	8730	32500 **

NOTE: DRAINAGE AREAS PLANIMETERED BY COLORADO WATER CONSERVATION BOARD-ENGINEERING DEPT., FROM
(a) AERIAL PLANIMETRIC MAPS (U.S. FOREST SERVICE) FOR AREAS IN COLORADO; AND
(b) U.S. GEOLOGICAL SURVEY STATE BASE MAPS (SCALE 1:500,000) FOR AREAS IN WYOMING AND NEBRASKA.
ABOVE AREAS ARE IN SUBSTANTIAL AGREEMENT WITH REPORTS OF U.S.G.S. (HYDROGRAPHIC DIVISION), BUT DIFFER FROM AREAS REPORTED BY U.S. ENGINEER CORPS (H.D. 197-73D. CONG. 2D. SESSION) WHICH INCLUDE PORTIONS OF GREAT DIVIDE BASIN IN WYOMING AND OF SAND HILL-LAKE AREA NORTH OF RIVER IN NEBRASKA.
* AREAS IN AGREEMENT WITH U.S.G.S. DRAINAGE AREA ABOVE GAGING STATION.
** U.S.G.S. REPORTS 32000 SQUARE MILES ABOVE GAGING STATION.
(1) LARAMIE RIVER BASIN IN COLORADO.



20 year record

30 year record

STATE OF COLORADO
WATER CONSERVATION BOARD
ENGINEERING DEPARTMENT

INDEX MAP
NORTH PLATTE RIVER BASIN

TO ABOVE PATHFINDER RESERVOIR	
ABOVE PATHFINDER RESERVOIR TO PATHFINDER DAM	-
ABOVE PATHFINDER DAM TO WHALEN, WYOMING	-
ABOVE WHALEN, WYOMING TO BRIDGEPORT, NEBRASKA	400(1)
ABOVE BRIDGEPORT, NEBRASKA TO NORTH PLATTE, NEBRASKA	-
ABOVE NORTH PLATTE, NEBRASKA	

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DIFFER FROM AREAS REPORTED BY U.S. ENGINEER CO
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** U.S.G.S. REPORTS 32000 SQUARE MILES ABOVE GA
(1) LARAMIE RIVER BASIN IN COLORADO.

NATRONA
CONVERSE
NIOBRARA
PLATTE
GOSHEN
SCOTTS BLUFF
SIOUX
BOX BUTTE
SHERIDAN
SWEETWATER
CARBON
ALBANY
LARAMIE
KRAMER
BANNER
MORRILL
GARDEN
CHEYENNE
WYOMING
NEBRASKA
COLORADO

Scale
10 0 10 20 30 40 Miles

N

LEGEND
- Gaging Station with 11 to 20 year record
- Gaging Station with 21 to 30 year record
- Gaging Station with 31 to 40 year record
- Gaging Station with over 40 year record
- Laramie River Drainage Basin Boundary
- Drainage Basin above Gaging Station indicated

(180) River Miles from U.S. Army Engineers Report - House Document No. 197, 73d Congress, 2d Session.

Base compiled from U.S. Geological Survey state base maps - 1:500,000 - Corrected to 1938

LEGEND

- ation with 11 to 20 year record
- ation with 21 to 30 year record
- ation with 31 to 40 year record
- ation with over 40 year record
- iver Drainage Basin Boundary
- Basin above Gaging Station indicated

STATE OF COLORADO
WATER CONSERVATION BOARD
ENGINEERING DEPARTMENT

NORTH PLATTE RIVER BASIN

PRINCIPAL GAGING STATIONS AND DRAINAGE BASIN AREAS

Drawn N.P.N.	Recommended Asst. Chief Engineer	Approved Chief Engineer
Traced C.H.R.		
Checked J.W.E.		
Issued July 23, 1940	DWG. NO. 147-40-92126	
Revised		

MIDDLE FORK MICHIGAN RIVER

Cameron Pass Elev. 10285

MICHIGAN RIVER

South Fork
North Fork

Gould

Hebeth School

Illinois Creek

Walden

North Platte River

Bridge west of Cowdrey

Canadian River

STATE LINE - COLORADO WYOMING

Douglas Creek
Medina Creek
Big Creek

French Creek

Beaver Creek
Brush Creek
Cow Creek

Encampment River

Spring Creek
Saratoga

Jack Creek

Pass Creek

Fort Steele

SEMINOE RESERVOIR

Original mouth of Medicine Bow River

Sweetwater River
Canyon Creek

Sage Creek

PATHFINDER RESERVOIR

ALCOVA RESERVOIR

Alcova

Bates Creek

Poison Spider Creek

Casper Creek

CASPER

Deer Creek

Boulder Creek

La Prele Creek

La Bonte Creek & Antelope Creek

NORTH

DOUGLAS

Orin

ELEVATION IN FEET

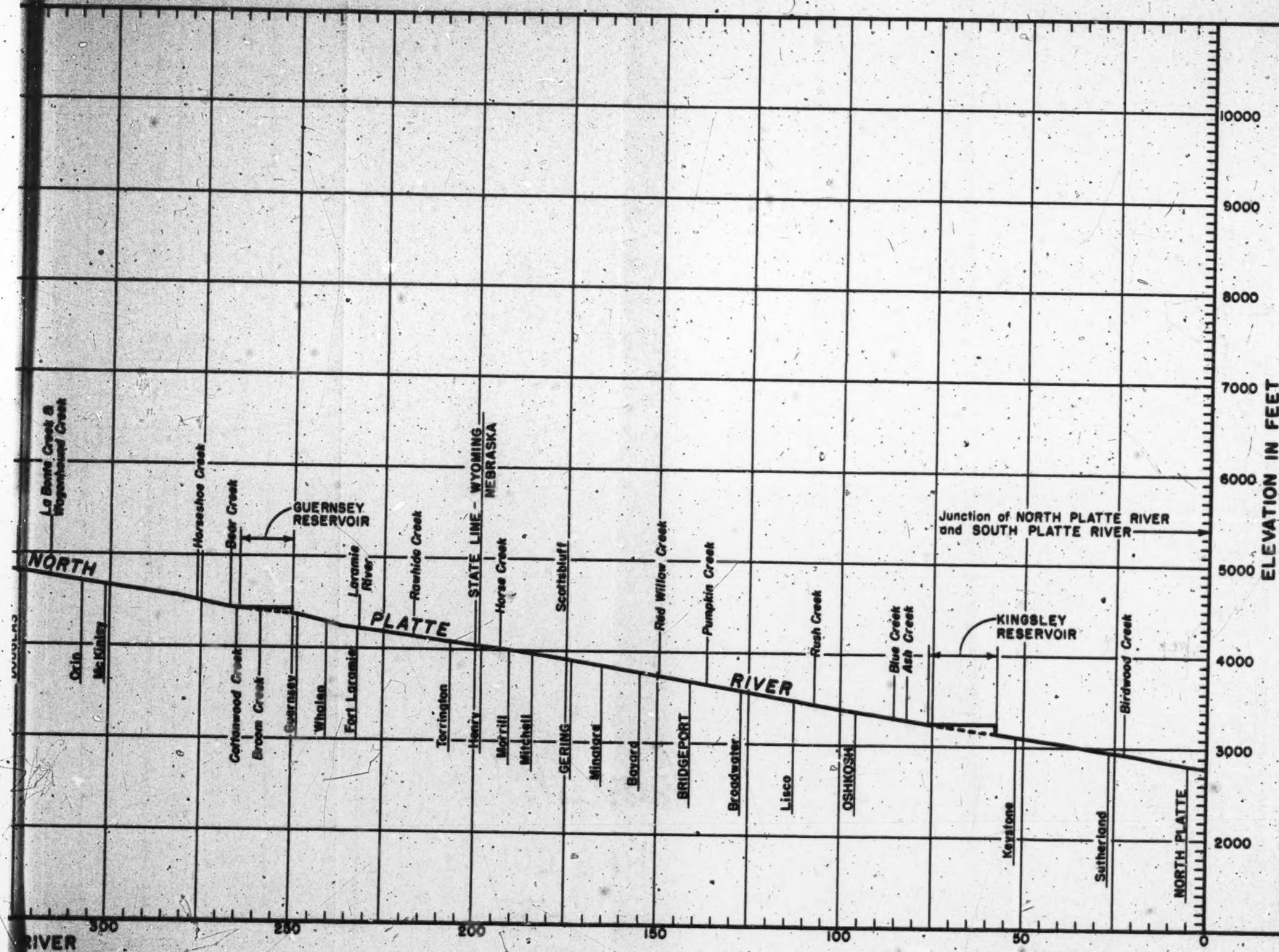
10000
9000
8000
7000
6000
5000
4000
3000
2000

750 700 650 600 550 500 450 400 350 300

MILES ABOVE MOUTH OF NORTH PLATTE RIVER

219

COLORADO EXHIBIT No. 72



NOTE: Datum is mean sea level.

SOURCE OF INFORMATION: U.S. Army Engineer's Report - House Document No. 197, 73d Congress, 2d Session. Records of the Colorado Water Conservation Board.

STATE OF COLORADO
WATER CONSERVATION BOARD
ENGINEERING DEPARTMENT

NORTH PLATTE RIVER BASIN
PROFILE
NORTH PLATTE RIVER

Drawn C.R.R.	Recommended 7-30-40	Approved 7/31/40
Traced C.R.R.	Asst. Chief Engineer	Chief Engineer
Checked J.R.E.		
Issued July 31, 1940	DWG. NO. 147-40-92130	
Revised		

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COLORADO EXHIBIT No. 104

Tightly Bound

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092-39-92102

INDEX MAP
NORTH PLATTE RIVER BASIN

EXTENT OF IRRIGATED AR

Values in acres

DRAINAGE BASIN	C
North Platte river direct	
Laramie river and tributaries	
Other tributaries North Platte river	
TOTAL	

NATRONA
CONVERSE
NIOBRARA
DOUGLAS
FREMONT
SWEETWATER
GREAT DIVIDE BASIN
CARBON
ALBANY
LARAMIE
BANNER
PLATTE
GOSH
SIOUX
BOX BU
LINCOLN
WALKER
ARAPAHOE
WYOMING NEBRA
COLORADO

Scale
0 10 20 30 40 Miles

N

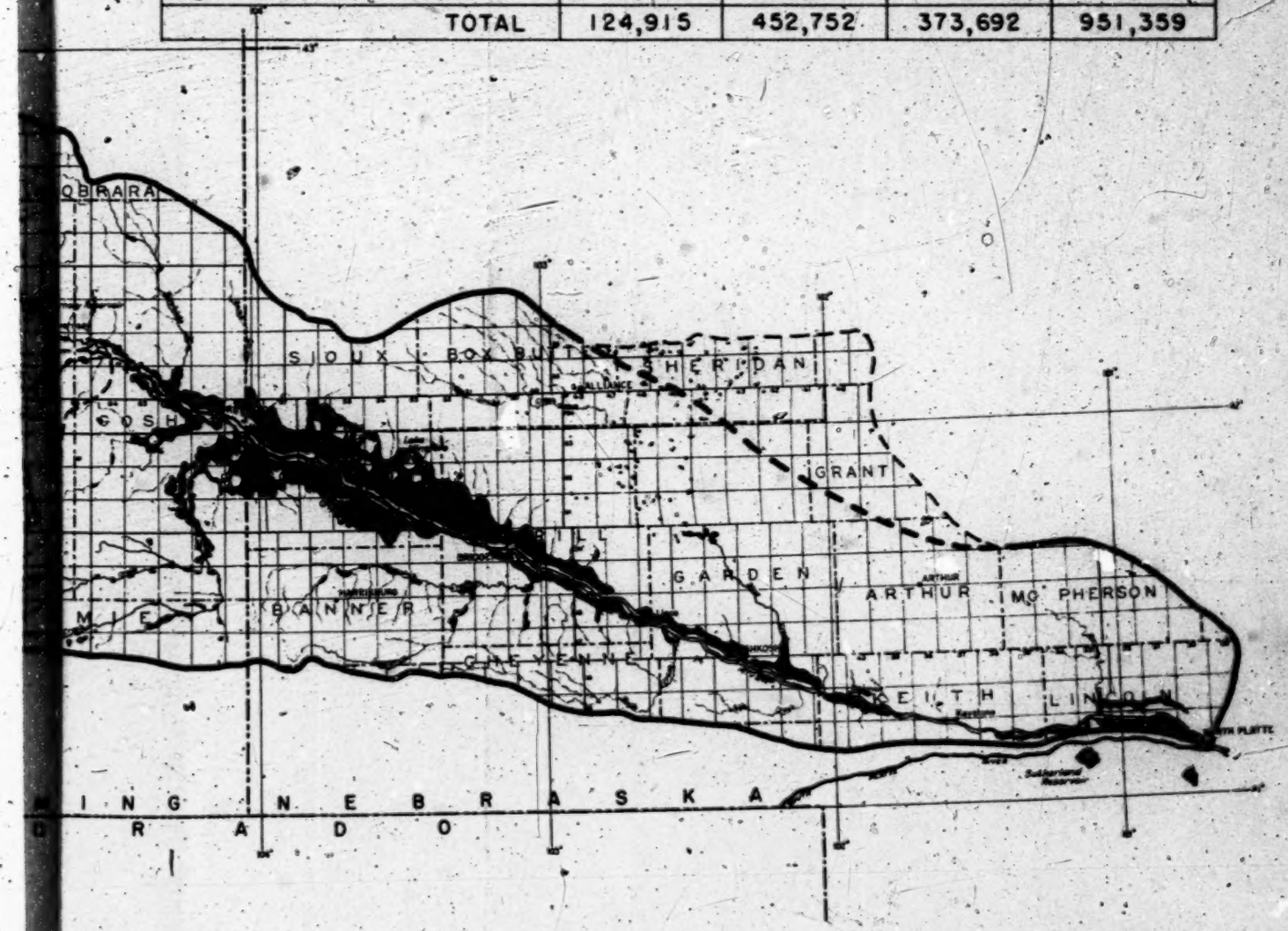
Approximate location and extent of irrigated land

Base compiled from U.S. Geological Survey state base maps - 1:500,000 - Corrected to 1938

EXTENT OF IRRIGATED AREAS AS REPORTED BY U.S. CENSUS 1930

Values in acres

DRAINAGE BASIN	COLORADO	WYOMING	NEBRASKA	TOTAL
North Platte river direct	7,470	81,313	352,480	441,263
Laramie river and tributaries	11,075	179,019	-	190,094
Other tributaries North Platte river	106,370	192,420	21,212	320,002
TOTAL	124,915	452,752	373,692	951,359



mate location and extent of irrigated land

STATE OF COLORADO
WATER CONSERVATION BOARD
ENGINEERING DEPARTMENT

NORTH PLATTE RIVER BASIN

IRRIGATED AREAS
1929

Drawn R.L.R.
Traced C.A.H.
Checked R.H.D.
Issued Oct. 7, 1938
Revised
DWG. NO. 147-39-9296

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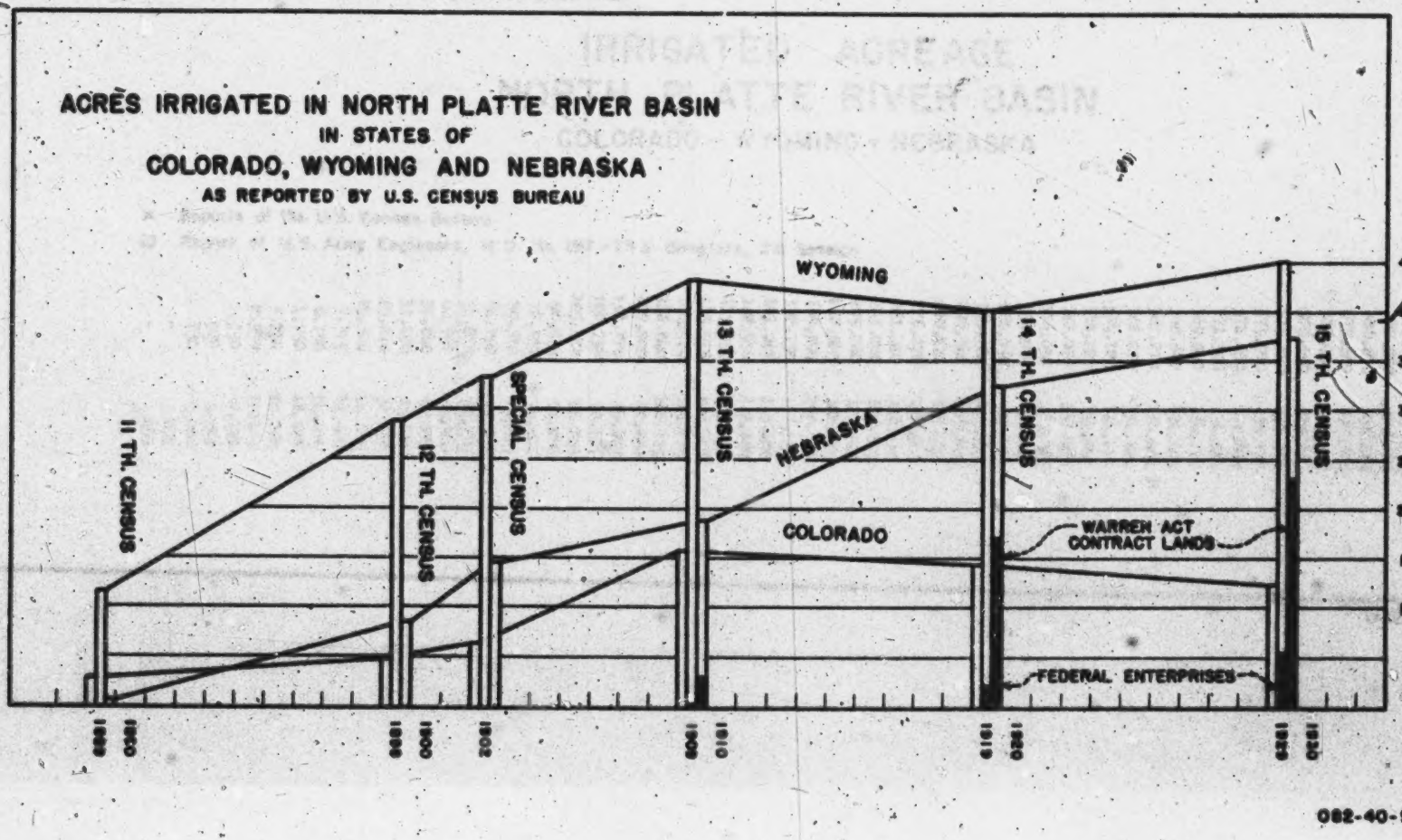
COLORADO WATER CONSERVATION BOARD – ENGINEERING DEPARTMENT.



COLORADO EXHIBIT No. 116

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COLORADO WATER CONSERVATION BOARD – Engineering Department

IRRIGATED ACREAGE
NORTH PLATTE RIVER BASIN
COLORADO – WYOMING – NEBRASKA

× Reports of the U.S. Census Bureau

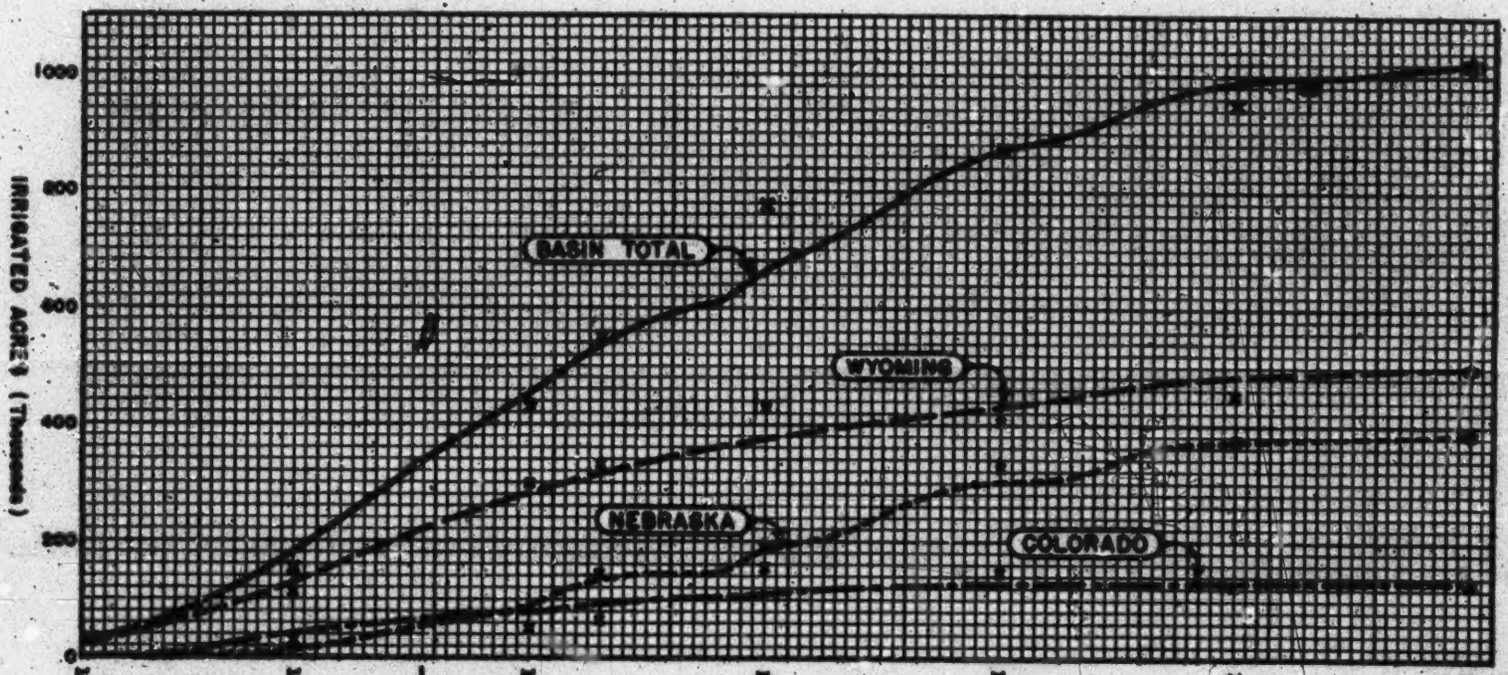
▦ Report of U.S. Army Engineers, H.D. No. 197 – 75 d Congress, 2 d Session

✱ Determined by Colorado Water Conservation Board

Colorado – Includes Jackson County and Laramie River Basin

Wyoming – Includes Main River, Laramie River and other tributaries, – private and U.S.B.R. project lands

Nebraska – Includes Main River and tributaries, – private and U.S.B.R. project lands



COLORADO EXHIBIT No. 117

227

082-41-92248

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COLORADO EXHIBIT NO. 56, PAGE 5.

JACKSON COUNTY INVESTIGATIONS

Summary of Production, Use and Disposal of Water

North Platte River and Tributaries

Jackson County, Colorado

	Values in Acre-Feet		
Mean Annual Production	Items	Totals	Percents
Total in Jackson County.....		635,100	100.0%
Chargeable to Colorado:			
Exportations at current rates	6,000		0.9%
Irrigation Depletions by Present Irrigation in County	98,580		15.5%
Sum—Chargeable to Colorado.		104,580	16.4%
Balance		530,520	83.6%
Conveyance to Wyoming Line..	24,930		3.9%
Available for Downstream Use.		505,590	79.7%

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UNITED STATES EXHIBIT 112-C.

Report of the Board of Review

on

North Platte Cooperative Investigations

Made to

The Secretary of the Interior

and

The Governor of Wyoming

(Sept. 4, 1920)

P. 8, Conclusions, Para. 19:

"(a) The North Platte River affords a sufficient water supply for the irrigation of the arable lands in Colorado and Wyoming that are likely to be developed and extensive additional areas in Nebraska provided the available reservoir sites are utilized for storage and all the water available is used to good economic advantage.

"(b) Further irrigation development in Colorado and Wyoming need not be restricted."

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UNITED STATES EXHIBIT 204-B.

U. S. Department of Commerce
Jesse H. Jones, Secretary
Bureau of the Census
16th Census
of the United States
1940

Irrigation
of Agricultural
Lands
Colorado

The following from pages 36 to 37, County Table I—Irrigated Farms and Tenure of Farm Operators, Etc.

	Item			Jackson Co.
18.	Area Irrigated	1939	acres	154,279

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EXCERPTS FROM PROCEEDINGS AT TORRINGTON, WYOMING, ON MAY 20, 1939.

Transcript Pages 15846-15848

MR. HOWELL: I was just saying that the Court will recall that at the opening session of this hearing the State of Wyoming presented a motion to dismiss the cause of action of the complainant, the State of Nebraska, and we announced at that time that we would file a motion, and leave was granted to prepare that motion, and, pursuant to that authorization, I would like to make that motion at this time in behalf of the impleaded defendant, the State of Colorado.

Comes now the State of Colorado, impleaded defendant, at the conclusion of the presentation of the evidence by the complainant, the State of Nebraska, and said complainant having rested its case, and the defendant, the State of Wyoming, having moved that complainant's bill of complaint herein, and its alleged cause of action, be dismissed, and the said impleaded defendant, the State of Colorado, now moves that the Master find and recommend to the Court, that complainant's bill of complaint, and its alleged cause of action, and this entire case and proceeding, be dismissed, and that judgment be rendered in favor of this impleaded defendant, and that said State of Colorado be awarded its costs in this behalf, upon the grounds and for the reasons as follows, to-wit:

1. That the pleading of complainant herein fails to charge this impleaded defendant with the commission or omission of any act or duty resulting in injury to the legal rights of said State of Nebraska; and that no substantial evidence has been introduced in this cause upon the part of complainant sufficient to support or sustain any judgment, order or decree in favor of the said complainant and against this impleaded defendant, the State of Colorado;

2. That there is no allegation in the amended and supplemental answer of the State of Wyoming, or elsewhere in the pleadings of said State charging any substantial

injury to the said State of Wyoming or its citizens caused or committed by the State of Colorado or its citizens;

3. That the principal purpose, as alleged in the pleadings, in impleading the State of Colorado in this case was to secure adjudication of the equitable apportionment of the benefits of the North Platte River to which the States of Colorado, Wyoming and Nebraska, respectively, are entitled; that if any of the said states is to be dismissed as a party herein without dismissing the entire proceedings, then the purpose for which this defendant was impleaded, will be destroyed and defeated;

4. That as to any issue formed by the petition of intervention of the United States of America, intervenor, and the pleading of any of the litigant states, it must follow that upon the dismissal of the bill of complaint of the State of Nebraska, the petition of said intervenor likewise must fail for want of necessary parties;

5. That if it shall appear to the Master and the Court, that the bill of complaint of the State of Nebraska against the defendant, the State of Wyoming, should be dismissed, it necessarily follows that the several alleged causes of action of the respective parties against this impleaded defendant, and the entire proceeding, must likewise be dismissed;

6. That the State of Colorado, impleaded defendant, reserves the right, if this motion be denied, to present all matters and issues pleaded in her behalf to the same extent and to the same effect as if this motion had not been presented.

I assume, Your Honor, that this motion will appear in the record immediately following Your Honor's ruling on the Wyoming motion.

THE MASTER: It will be given the same force and effect as though it were presented at that time. However, the record has already been transcribed, so it is not practicable to put it in that place.

EXCERPTS FROM PROCEEDINGS AT DENVER, COLORADO, ON DECEMBER 19, 1941.

Transcript Pages 29471-29474

MR. BREITENSTEIN: The second motion I have is one to dismiss.

Comes now the State of Colorado, impleaded defendant, and moves that the Master find that no substantial injury has been sustained by or is threatened to any of the parties hereto, and that the Master recommend to the Court that this entire case and proceeding be dismissed, and that the State (29472) of Colorado have judgment for its costs in this behalf expended.

As grounds for such motion the State of Colorado, impleaded defendant, says:

1. No substantial evidence has been introduced in this cause sufficient to sustain any judgment or decree against the impleaded defendant, the State of Colorado.

2. Upon the law and the evidence no party hereto has shown any right to relief against any of the other parties.

3. Neither the bill of complaint of the State of Nebraska, the amended and supplemental answer of the State of Wyoming, nor the petition in intervention of the United States, nor any other pleading in this cause, charges that the State of Colorado, or any of its citizens, have committed, caused to be committed or threaten to commit any substantial injury to the United States, the State of Nebraska, the State of Wyoming, or any of them.

4. No substantial evidence has been introduced in this cause sufficient to sustain a finding that the State of Wyoming, or its citizens, have ever withheld, are now withholding or threaten to withhold from the State of Nebraska all or any portion of the equitable share of the benefits of the water of the North Platte River or its tributaries to which the State of Nebraska and its citizens are entitled.

5. No substantial evidence has been introduced in this

cause sufficient to sustain a finding that the State of Colorado, or its citizens, have ever withheld, are now withholding or threaten to withhold all or any portion of the equitable share of the benefits of the water of the North Platte River or its tributaries to which either the State of Nebraska and its citizens or the State of Wyoming and its citizens are entitled.

6. No substantial evidence has been introduced in this cause which would justify or require the apportionment among the several states of the benefits of the flow of the North Platte River. To justify such an apportionment there must be a showing not only of substantial injury by one state to another state but also that the benefits of the stream as afforded naturally and put to use by the several states are so inequal as would require one state as a matter of equity to forego benefits in order that another state may receive its equitable share of the benefits of the stream.

7. The evidence affirmatively shows that since the filing of the bill of complaint herein numerous dams have been constructed to impound the waters of the North Platte River in quantities greatly in excess of the amount that could have been impounded theretofore. Evidence of the operation of such dams, the amount of water that will be impounded thereby, and the release of water therefrom for irrigation purposes is entirely speculative and conjectural in character and furnishes no basis for the equitable apportionment between the litigant states of the benefits of the flow of the North Platte River.

8. There is no substantial evidence which establishes a reasonably fair and just basis for the equitable apportionment of the benefits of the water of the North Platte River.

9. The petition in intervention of the United States is predicated upon the theory that the intervention of the United States is necessary to protect rights of the United States from injury by any decree that might be entered

in this case. The dismissal of this entire case and proceeding will not injure any right of the United States.

The State of Colorado, impleaded defendant, reserves the right, if this motion is denied, to participate and be heard in all further proceedings in this cause.

Transcript Pages 29470-29471

MR. BREITENSTEIN: The first is a motion to require the United States to elect.

The State of Colorado, impleaded defendant, moves that an order be entered requiring the intervenor, the United States, to elect between its first cause of action and perhaps what we might call the second cause of action, as set out in its petition in intervention. As grounds for such motion the State of Colorado says:

1. The first cause of action asserted by the intervenor apparently proceeds upon the theory that the United States is the owner, proprietor and sovereign over the unappropriated waters of the North Platte River. The second cause of action seems to proceed upon the theory that the United States has acquired rights by compliance with the state laws of Wyoming and Nebraska by making appropriations thereunder.

2. These two theories are antagonistic and inconsistent since proof of one disproves the other.

3. Unless the United States makes an election between the two causes of action the issues of this case are unnecessarily and unduly confused to the prejudice of the litigant states.

I might say that motion was made before. It is merely made at this time for the sake of the record. I understand the Master indicated before that he had no power to rule on that motion.

EXCERPTS FROM TESTIMONY.

UNITED STATES WITNESS ANDREW WEISS

Transcript Pages 20447-20449

Direct Examination by Mr. Burke:

Q. When you first became acquainted with the North Platte River, in the period of 1888 to 1898, you were living on Colorado?

A. Yes.

Q. And that acquaintance was confined to the headwaters of the river?

A. Yes.

Q. I believe you testified that during that period you were engaged in practical irrigation on lands in North Park, Colorado?

A. I was.

Q. What were your observations, Mr. Weiss, as to the flow of the river, say, during the middle of July and August and September of any year?

A. Our flow would generally run down along about the close of June or perhaps the early part of July to a very moderate amount.

Q. What would be the condition of the flow, say, in the period prior to the middle of July?

A. Then we would have the run-off from the melting snows, and, according to the weather conditions, if we had good weather conditions, and also the freezing of the ground during the winter before the snow came, that would be very variable, but generally our snow run-off would be completed along about the middle of July or earlier.

Q. In general, Mr. Weiss, what were the dates of the priorities of the water-rights in that area?

A. The very large part of it was appropriated prior to 1890. I think the records will show that.

Q. Did you experience any difficulty in the later part of your irrigation season in getting water under your rights?

A. Well, generally, yes. We exhausted the flow pretty much toward the close of our irrigation season, which would be along between the 15th of July and the end of July.

Q. In number of days, what is the usual length of the irrigation season in that area?

A. From about the first of May until the 15th of July.

Q. What is the type of agriculture that is practiced there?

A. The only type I have seen practiced was the growing of wild hay, and some had planted a little timothy, but the large part was native hay.

MR. WARREN: Mr. Burke, would you mind fixing the time?

MR. BURKE: This is 1888 to 1898, the time when he was engaged in that area in farming operations.

MR. WARREN: Are you speaking now of North Park?

MR. BURKE: Yes.

THE WITNESS: Yes, North Park.

Transcript Pages 20969-20970

Cross Examination by Mr. Wehrli:

Q. When the Pathfinder was constructed, under permits and applications dated from 1904, of course, you were familiar with the entire project from its different angles, and, no doubt, you had a great many conferences with representatives of the Government and others in connection

with the construction of the Pathfinder and the use to be made of it?

A. Yes, sir.

Q. There was no intention or expectation, was there, of the Pathfinder making any interference whatever with the development above?

A. We never thought of any interference, and, least of all with any vested rights that existed at that time.

Q. You were project manager from 1907 to 1924, were you?

A. Yes, from June, 1907, to the end of 1924.

Q. During all of that period of time, did you ever make any effort to interfere in any way with any development or use of water above Pathfinder?

A. No, I never did.

Q. Did it ever occur to you to call upon any irrigator above Pathfinder to close down his ditch to supply any water for Pathfinder?

A. Never.

Q. You never had any such intention?

A. I never had any such intention and I never did make any such request.

UNITED STATES WITNESS CONKLING

Transcript Pages 21380-21383

Direct Examination by Mr. Stoddard:

Q. Mr. Conkling, in your testimony this morning you stated that one of the factors necessary to consider in order to reach a conclusion upon the purpose of the study, that is, as to whether or not the physical characteristics of this stream system, in connection with the water flows and discharges of the river at various points, would lend themselves to an equitable solution of allocation of the waters

between the states—one of those factors that you referred to that you believed necessary to consider was whether or not the study of the discharge in the river during the irrigation season was such as to be favorable to the administration of the river under the strict doctrine of priority extended throughout the length of the stream where irrigation is practiced regardless of State lines. Now, basing your answer upon the studies that you have made, and the exhibits that have been introduced, and the stream-flow records and data that you have considered, will you state whether or not, in your opinion, the discharge during the irrigation season is such that it is favorable and feasible to administer the river on a strict priority basis throughout the entire length of the stream?

MR. GOOD: That is objected to as incompetent, irrelevant and immaterial; beyond the province of the witness; no sufficient foundation laid; not a proper matter for expert testimony, and encroaching on the province of the Court.

A. It would not be possible to administer the river throughout its length on the basis of priority.

Q. Upon what do you predicate that?

A. I predicate it upon the exhibits which have been introduced heretofore in this case, and the testimony, and my own personal knowledge of the river; the climatic conditions in the lower part of the river, particularly from Whalen down to Kearney, are such that fluctuations of flow are impossible to anticipate; the time of travel from the upper reaches of the river to the lower is such that there would be no proper basis, in view of the difficult situation in the lower river of closing canals above to furnish water to the lower river; if flow were kept in the river sufficient to give the lower canal a supply at the time when the flow was smallest, due to climatic fluctuations, there would be a large waste of water to points below. It is a very difficult situation we find in this river. This river is about the most difficult river that I have any knowledge of in the western United States to administer on any such basis as the priority basis. It is very difficult in any stream where

attempt is made to make the administration over a considerable length of the river.

Q. Mr. Conkling, basing your answer upon the studies you have made of the stream flows, and the fluctuations of those flows, and the Nebraska exhibits in the record, will you state whether or not, in your opinion, the administration of the flows as shown by the record in the State of Nebraska has been upon a strictly priority basis?

A. It has not been.

Q. Again basing your answer upon the available flows, and the studies that you have made thereof, and the studies of the recorded climatic conditions and variations of flows, state what effect, in your opinion, the administration based upon priorities throughout the stream, would have upon the future economic status of the areas upstream.

A. The present development of the river in all sections is based upon the unhampered taking of the waters, and thus, naturally, very little priority of administration has been attempted in Wyoming, according to their own exhibits, and, presumably, in Colorado, although they have done some; and, in Nebraska, the Nebraska exhibits show that there has been very little actual administration on the basis of priority. Now, these developments have grown up based on water supply and based on ability practically to take whatever water was available at their headgates. If, now, these existing developments should be deprived of water by the asserted prior right at the lower end of the river—I mean, primarily, the Kearney Canal and any others with prior rights—it would deprive the upper river users of water that they are now using and destroy economic values. I don't know as I can say any more on that particular matter.

Transcript Pages 21542-21544

Cross Examination by Mr. Wehrli:

Q. Assuming, Mr. Conkling, that you could anticipate it a little bit earlier, and assuming a recurrence of the 1934

run-off, which, at Pathfinder, was about 380,000 acre feet, there wouldn't be any way that you could shut off junior rights above Pathfinder and provide what is the average or mean supply of the last forty-five years, or 1,300,000 acre feet, at Pathfinder?

A. Oh, no, it would be a very small increment to the supply that you could get out of the junior rights. The increase in use above the Pathfinder since the Pathfinder right has been quite small.

Mr. GOOD: I move to strike the statement of the witness as to the increase above Pathfinder, for the reason that it is a voluntary statement and for the reason that the witness has already testified that he had no knowledge of the river since 1918 except for the two-day trip last month, and that was only from Whalen down to Kearney.

Q. Now, Mr. Conkling, I called your attention to Paragraph 10 on Page 3 of the letter, and that is no doubt what you had in mind when you and Mr. Meeker wrote that paragraph into this report about the inability of making up any shortages for the North Platte project by the shutting off of junior rights above Pathfinder, and that it simply could not be done.

A. No, I think we had something else in mind.

Q. Will you state what you had in mind in this part of the report?

A. When a reservoir starts to empty, a large reservoir of the capacity of the Pathfinder or any of these large reservoirs on the stream, and not being able to anticipate what the next year will be, or the next year, and so on, no administration would seem to be just, at least, that would stop junior priorities above merely because the Pathfinder Reservoir had space in it, because, since that is a hold-over reservoir, it may be in the next year or the succeeding two or three years the reservoir will fill up again, and all that you have accomplished by cutting off the junior priorities above is to cause some waste from the reservoir when it could not be used in a subsequent year.

Q. In other words, you have a damage to the juniors above without conferring any benefit on the seniors below?

A. Yes.

Q. So that if you shut off juniors above the Pathfinder for the purpose of creating a carry-over storage in Pathfinder in a particular year, and then in the succeeding year there is a large run-off and the carry-over is unnecessary, you have injured a junior above without necessity, so to speak?

A. That is the case, yes. That would be the case.

COLORADO WITNESS CHARLES L. PATTERSON

Transcript Pages 21943-21944

Direct Examination by Mr. Warren:

Q. Do you care to make any further comment concerning the matters shown on Exhibit No. 28, Mr. Patterson?

A. Yes, I would. When we had prepared the annual hydrograph of the North Platte River at Northgate, as shown on Colorado Exhibit 27, the question arose as to whether or not the decline in flow at that station during recent years was due to increased uses or depletions of the stream flow above. We went into that question from two standpoints, one a study of the uses of water above the Northgate station, and from that study concluded that there had been no increased depletion during the last nine years that would account for such a decline in the stream flow. That will be shown in subsequent testimony. Instead the North Platte River, we found from our second study, which is outlined in Colorado Exhibit 28, has been affected by the same cycle of deficiency precipitation that has caused declines in the flow of all of the adjoining and neighboring streams.

Of course, in all of these studies the objective is to try to forecast what another cycle of years in the future may show in the way of water production and stream flow run-off. While no one may forecast with certainty what the cli-

matic conditions will be during the next year or the next decade or during a coming period of 45 years, still we believe that it is reasonable to assume that in general the history of natural phenomenon will repeat itself. On such an assumption, whether we realize it or not, all our present long-time investments are being made. In our opinion there is as much assurance that natural and undeveloped stream flows during the next 45 years will be greater than they were during the past 45 years as there is to forecast the reverse condition. Certainly there is no recorded experience except the fact that previous drought cycles have been followed by more normal conditions. On the basis of that recorded experience it would seem reasonable to assume that the present deficiency will pass and be followed by more normal precipitation and stream flow conditions.

BY THE MASTER:

Q. Is there any record, Mr. Patterson, of the previous six-year cycle that would be comparable to the last six years, as to the remedy of it?

A. There is on the Rio Grande River as far as runoff is concerned. You will note on that river back in the six-year period 1899 to 1904 that it got down to an average just 70 per cent of the mean, whereas in the recent period of nine years there is no six-year period lower than 75 per cent.

Q. That condition does not seem to have been as widespread back in that period as recently.

A. No, as a matter of fact that drought in the late 80's and 90's was not as widespread as this, for you notice it did not affect the Poudre River. The flow of that stream was above normal. In the same period the Rio Grande was considered below normal.

When I say recorded experience I have in mind not only these stream flow records that are here portrayed over a 45-year period, but I also have in mind the somewhat longer precipitation records over the West, some of which are 75 years or more of duration; and while there are rec-

ords of extremely low precipitation in any given year that are quite common to all the western stations, and in some instances from the successions of two or three years of that aggregate, still I believe it is true that never before have we had one that has extended as many years as the nine years involved in this present cycle of drought.

Transcript Pages 22165-22167

Direct Examination by Mr. Warren:

A. The existing enterprises are all located at Cameron Pass. They are the Cameron Pass Ditch and the Michigan Ditch. Together these export water from the headwaters of the North Platte River or from this tributary, the Michigan River, in amounts ranging from 1000 acre feet in deficient seasons to about 8000 acre feet in the best water supply years. The average of such diversions for the period of the record, 1913 to 1939, having been about 4000 acre feet.

I want to state in that connection that our studies show that the ditches as originally constructed and as extended and enlarged during past years, I believe all of those sometime ago—at any rate our studies in recent years when daily discharges have been available show that we might anticipate in a mean future a cycle of years, assuming the present diversion capacity to be maintained, not to be enlarged or extended, at approximately 6000 acre feet per season.

The extensions of these ditches as outlined on the two filing maps just discussed, Colorado Exhibit 45 and Colorado Exhibit 46, if those extensions are constructed, our guess or opinion is that they might together increase these exportations by about 6000 acre feet per year, making a total in the future after these extensions are built of about 12,000 acre feet annually of exported or transmountain diversion water.

Q. In your opinion are exportations above the figure of 10,000 acre feet possible?

A. I gave that figure as 12,000. The 10,000 figure that

you cited would be the average of past diversions plus the estimated future diversions of the proposed extensions. That figure might be better read 12,000, as the estimated future diversion after the proposed extensions are built, and under normal water supply conditions.

In our opinion, no exportations in excess of that amount are possible except if tunnels be constructed through the mountain ranges, or in lieu thereof extensive pump-lifts shall be involved.

I believe also to attain that figure, and certainly to justify any larger scale developments involving tunnels, that replacement storage reservoirs would be necessary.

Transcript Pages 22335-22339

Direct Examination by Mr. Warren:

Q. You mention willow-covered lowlands as having been reduced to an extent. Would those growths of willows transpire a considerable amount of water in their original condition?

A. Yes. And it should be recalled, under original conditions, that there were a large number of beaver in that country. The beaver dams across these little streams had the effect of creating ponds, and they in turn were water-consuming in character.

Q. Is there any historical documentary evidence as to the former condition of North Park?

A. Yes. I have read quite a number of such historical documents. In reading them it should be recalled that Jackson County or North Park had different names in various of those historical documents, among other names the word "New Park" is used by some, and the term "Bull Pen" is used by others. Then the area had an Indian name which translated is said to mean "Cow Lodge." In any event, regardless of the name, all of these historical documents are in agreement to the effect that the region was a wild game paradise, that buffalo, deer, elk, and antelope

grazed there in large numbers, and that beaver were so abundant along the numerous streams as to attract many of the early-day trappers.

Q. Are beaver there at the present time?

A. Yes, there are, but of course, in very relatively few numbers.

Periodically, it has been necessary to capture and remove some of those which survived in order to prevent them from building dams in the creeks and from breaking the banks in irrigating ditches. Only last winter the Colorado Fish and Game Commission, acting upon the demands of ditch owners and operators in Jackson County, undertook the capture of an estimated 1000 beaver in North Park.

Q. Would you state whether beaver are at present protected by the Colorado state game laws?

A. Yes. It is illegal to kill them or trap them, and the only way that these ranchmen could avoid the damage that they were causing to their ditches and their property was to appeal to the state agency, who sent their regular hunters and trappers up there and undertook to capture about a thousand of them. I am not confident how many they did actually catch last winter, but I do know that they undertook that project.

Q. In the original condition of the park, have you any information as to whether the beaver were plentiful?

A. Yes. These historical documents indicate that beaver dams and beaver ponds were everywhere, along practically all of the streams on the North Park.

Under those conditions what might be termed a natural irrigation system was created. Under that system the very flat areas and the free-water surface exposures were undoubtedly greater than the areas that we have recently ascertained and in our calculations have charged to natural consumption under present conditions.

Q. That is, you think the actual facts, had you been

able to show just precisely what lands were covered by beaver ponds and by growths of willows and such like water-consuming natural feeders, that the comparison would have resulted more favorably to Colorado than what you have used?

A. Yes. It would tend to diminish the quantity that we have said is chargeable to irrigation development in Colorado, and to have increased the item which we have listed under "Natural Consumption" or "Conveyance Losses." In other words, the total consumption under those original conditions, as created by beaver and non-valuable vegetation, probably consumed a larger quantity of water than we have now charged that natural agency with.

Q. State your conclusion as to what the effect would be, as compared to the previous condition, of a large number of beaver ponds.

A. The lands that formerly were covered by beaver ponds and by the native vegetation that are now converted into hay meadows and pastures probably consumed as much or perhaps more water than the same land today is consuming. In any event, the conversion of such lands to irrigated lands and the intentional irrigation of such lands has added very little even to stream depletions, has altered the outflows from Jackson County very little, if at all.

Q. Suppose, for purposes of illustration, that the irrigation we have in North Park should be abandoned and the region converted to a wild game refuge. What would the result be?

MR. GOOD: We object to this as speculative, conjectural, irrelevant, incompetent, and immaterial, of no value in this case.

MR. WEHRLI: Wyoming makes the same objection.

Q. You may answer, Mr. Patterson.

A. If irrigation in North Park should be abandoned and the region be converted to a wild game refuge—and I might state that such a proposal has been definitely under

consideration and has been investigated by our department not only in North Park but in South Park—it is doubtful in my mind if the recovery of water for use in downstream areas would be as great as our calculations and investigations have indicated. I make that prophecy or assertion because I firmly believe that natural irrigation would continue, at least, to involve some of the lands, and that its resulting consumption of water would be expanded by dams, barriers and other water-spreading devices, which would create equivalent water-consuming areas.

Q. You have made mention of these conditions prevailing in North Park during the early periods prior to its settlement and prior to the development of livestock and irrigation industries. Upon what are your opinions as to such early conditions based?

A. On information obtained from various historical documents.

Transcript Pages 22368-22370

Direct Examination by Mr. Warren:

Q. What comment would you make, Mr. Patterson, as to summer grazing in Jackson County?

A. The livestock of Jackson County are largely and usually grazed on the adjoining national forests for periods averaging about 105 days, beginning commonly in June and ending in September. There are intervals of roughly six weeks in the spring and fall between the summer grazing and winter feeding periods, and during those intervals the livestock must be cared for or pastured at or near home.

Q. Will you comment on the recent cycle of years as to what has happened concerning this summer pasture?

A. There is a very definite shortage of summer pasture in Jackson County. A part of that is due to the regulations and limitations imposed on the use of public lands in national forests, and part of that is due to the cycle of recent drought years when deficient precipitation on the mountains

and the valley floor of North Park have failed to produce the usual amount of grass in those areas.

Q. I will ask, Mr. Patterson, whether recent drought conditions over a cycle of years might or might not have something to do with the imposing of limitations upon grazing on the public lands.

A. Yes, I think, undoubtedly, that climatic situation has been what has prompted the people in charge of these national forests and public domain to impose increasing limitations on the number of cattle that may be pastured in those areas. That is intended to preserve those areas against over grazing and the resulting disastrous effects of erosion that follow such over grazing.

However, I also feel that even though normal conditions as to rainfall should recur, that the number of livestock permitted to graze in the national forests and on public domain will never again be as great as it was previously because of the general attitude of the federal government not to permit over grazing. They have found that before these limitations were imposed, and they were imposed before this recent cycle, that they were necessary in order to prevent over grazing even under normal conditions. So I would anticipate that if normal conditions return, the number of cattle in the lands will not be as great as they used to be.

Q. Is there anything suggested or indicated by this study as a measure to bring the industry into balance?

A. Yes. It is quite definitely shown, I believe, that there is need for additional grass on which to pasture the livestock during periods when winter feeding is not required. This need can be met in one of two ways: either by reducing the number of animal units to feed the summer pastures' capacity—a procedure which I believe, if attempted, would be undesirable, if applicable—or the second way, by increasing the capacity of the summer pasture. To do that, additional irrigational development is necessary, but that is a desirable procedure in the case of both

Jackson County and the State of Colorado. That is to say, to try to hold on to what you develop rather than to be forced to go back to a lower scale than we now have.

Transcript Pages 22388-22389

Direct Examination by Mr. Warren:

Q. Would you read the whole paragraph (referring to Colo. Ex. 60)?

A. The second paragraph reads as follows: "For about fifteen years the U. S. Reclamation Service has taken the position that there was insufficient water for additional irrigation development above the Pathfinder Reservoir. The upper North Platte basin has experienced the same treatment accorded the upper Rio Grande basin above the Elephant Butte Reservoir in New Mexico. Irrigation development has been held up, rights-of-way denied and some projects temporarily abandoned."

Q. I think you might read right on through, if you will, to the bottom of the page, at least.

A. The third paragraph of page 1 of the letter reads as follows: "Reference is made to a recent cooperative investigation and report between the State of Wyoming and the U. S. Reclamation Service concerning the future utilization of North Platte water. This report is based upon a careful engineering investigation covering the entire North Platte basin to the eastern limit of irrigation at Kearney, Nebraska, and involving nine months' time and expenditure of over $10,000."

The fourth paragraph reads: "The conclusion of the Board of Review was substantially, there is sufficient water for all irrigable lands of the basin and now there is no need for restrictions on irrigation development above Pathfinder Reservoir.

"From information now on hand 137,000 acres are irrigated in North Park, Colorado, and the irrigable lands which ultimately will require water supply approximate

100,000 acres. North Park projects in Colorado have experienced delays and troubles, and the attached correspondence indicates the means used by the U. S. Reclamation Service to protect their Pathfinder water supply for use on the 250,000 acre North Platte project in eastern Wyoming and western Nebraska."

Transcript Page 22395

Direct Examination by Mr. Warren:

Q. How does that figure differ from Mr. Meeker's?

A. As I stated, we can not find any such an amount of land up there. The unirrigated lands that we have called arable lands and are pictured on the map Colorado Exhibit 58 aggregate a total of 34,400 acres.

Q. And in making up your 34,000 some odd acres, you have surveyed and classified the tracts of land that might now be under irrigation and probably would be, except for delays incident to securing rights-of-way agreement, is that the way of it?

A. Yes. This Walden Ditch and Reservoir project being one of them, and this area being, according to our surveys, 15,740 acres, the estimate contained in the Meeker report as to that project showing 15,000 acres even, that figure appearing on page 3.

Q. Well, in considering the possibilities of North Park, Jackson County, development, Mr. Patterson, have you or have you not confined yourself to gravity systems, to the exclusion of any ideas of pumping water for irrigation supplies?

A. Yes, we have excluded the possibilities of pumping on the ground that the cost is not justified by the resulting benefits.

Q. Under present economic conditions?

A. Yes.

Transcript Pages 22429-22430

Direct Examination by Mr. Warren:

Q. In connection with Jackson County project lands, those were susceptible of irrigation from the Michigan River?

A. Yes.

Q. And the original sponsors contemplated some reservoir development.

A. Yes; they contemplated the construction of the Sabin Reservoir, in the upper headwaters of the Michigan River, or the south branch of the Michigan River, and also the North Michigan Reservoir site on the North Michigan River.

Transcript Pages 22430-22431

Direct Examination by Mr. Warren:

Q. Will you state whether there is a project known as the Johnny Moore Reservoir site?

A. Yes, surveys have been made of a site known as the Johnny Moore Reservoir site. It is a channel reservoir site on the Michigan River, in the general vicinity of the Haworth School. This site can be developed to a satisfactory size—that is, to a capacity of approximately 32,000 acre feet.

Transcript Pages 22433-22434

Direct Examination by Mr. Warren:

Q. Mr. Patterson, will you examine the item marked for identification Colorado Exhibit No. 67, and state what it is?

A. Colorado Exhibit No. 67, consisting of two sheets, is a photostatic reproduction of the filing map and statement of claim bearing the number 5896 in the office of the

State Engineer of Colorado. This was a preliminary filing accepted in the office of the State Engineer of Colorado on June 1, 1909. It relates to a reservoir site known as the Rand Reservoir, located on Willow Creek just east of the town of Rand.

Q. Do you have the number of this filing?

A. The number is 5896 in the State Engineer's office.

Q. Is that shown in the lower right-hand corner of the first sheet?

A. Both of the sheets bear that number.

Q. And it bears the certificate on the face of it that it is being presented for filing?

A. Yes.

Q. Are you familiar with this reservoir site?

A. Yes.

Q. What would you say as to the character of the site?

A. The Rand site is a good reservoir site as they are classified in mountain regions; it is one that might be developed, if water supply is justified, with a capacity of 81,000 acre feet.

Transcript Pages 22438-22439

Yes, there are several others. As shown on the map, Colorado Exhibit 58, there is a reservoir site on Grizzly Creek—Big Grizzly Creek—in the general vicinity of Spicer School and the Spicer Post Office. Surveys of that site indicate a probable capacity for a reservoir of 13,800 acre feet. Then just to the west there has been a survey of a reservoir site on Colorado Creek, with a capacity of 3200 acre feet; and to the north of those two, in the vicinity of the Pole Mountain Lakes, on Grizzly Creek, there is a reservoir site known as Coalmont Reservoir site, with a capacity of 23,500 acre feet, that being on the south fork of Little Grizzly.

Transcript Pages 22444-22446

Direct Examination by Mr. Warren:

Q. Mention has been made of some attempts by the Department of the Interior authorities to protect its Pathfinder project water supply through defeating proposed irrigation developments in Jackson County. Are you familiar with the methods used?

A. Yes, I believe I am. There were several of them. One was to refuse to grant Colorado's withdrawal application under the Carey Act. The second method was to refuse to grant rights of way for ditch and reservoir construction. And the third was the one mentioned in connection with the Walden Ditch and Reservoir Project, where the right of way agreement was so restricted as to prevent the financing of the project.

Q. Was there any other method used by the Department of the Interior?

A. There was another method that was employed: Under the desert land Act, entries upon the public domain of Jackson County were denied where the ditches proposed for construction were yet to be built, that is to say, after about 1910, or where the water rights of constructed ditches to be used for the irrigation of the entered land, or portions thereof, were dated after the priority date claimed on behalf of the Pathfinder Reservoir.

Q. What is your understanding as to these several rulings and actions of federal agencies subsequent to the time of the original rulings and actions?

A. It is my understanding that they were subsequently revised or withdrawn.

Q. In the meantime, however, what had happened?

A. In the meantime there was some damage, that is to say, there were certain specific projects that were defeated by the delays which they encountered. Another point that may have a bearing is the fact that Jackson County got

the reputation of being a locality where it was useless to make applications for rights of way or to take up land under the Desert Land Act, for the reason that the government had gone into the irrigation business in the downstream areas and would permit no competition.

Q. Would it be possible for you to estimate accurately the amount of this damage that was suffered by Jackson County and the State of Colorado?

A. No, I do not believe I could make an accurate estimate of the damage.

Q. Do you think anyone else would be able to do it?

A. Well, not accurately, I would say. I think anyone could make some kind of an estimate. I mean to get it down to an accurate determination of the injury, I doubt if that could be done by anyone.

Transcript Pages 22861-22862

Cross-Examination by Mr. Wehrli:

Q. Well, Mr. Patterson, if you were asked to give a percentage of the amount diverted in North Park as a whole over those three months, would you accept those percentages as being about right?

A. Yes, I think they are indicative of about the situation that prevails up there.

Q. And they indicate about what the demand would be, not in terms of supply, but in terms of percentages over the irrigation period?

A. No, they more nearly indicate actual performance or practice. As I have repeatedly said, there is a shortage of water more or less chronic in July, and as far as demand is concerned, North Park could use more water in July with benefit.

Q. That is a demand under present conditions developed that can not be supplied?

A. No, there is only one possibility of meeting it, and that is to regulate the stream flows by reservoirs.

COLORADO WITNESS BOSTON

Transcript Page 23136

Cross-Examination by Mr. Wehrli:

Q. Did you ever have any request or direction from anybody to make any regulation in North Park for the benefit of any appropriator in Wyoming?

A. No, sir.

Q. Did you ever have any request or direction from anybody to make any regulation in North Park for the benefit of any appropriator in the State of Nebraska?

A. No.

Q. Did any such request ever come to you, either directly from the State of Wyoming or the State of Nebraska or an appropriator in either of those states?

A. No, sir.

Q. Or was any such request ever transmitted to you from your superior, the State Engineer?

A. No, sir.

COLORADO WITNESS WHITE

Transcript Page 23172

Direct Examination by Mr. Warren:

Q. What would you say about the general practices in the Park now as to whether the ranchmen are over-pasturing their meadows or not?

A. I think that everybody in the Park at the present time is forcing all their pasture, to try and take care of as much of their hay as they can.

Q. And the result of that is what?

A. Naturally the curtailment of their hay crops.

Q. They keep their cattle on too late in the spring?

A. In the spring.

Q. Well, how could that be eliminated?

A. Well, by developing a sufficient amount of extra pasture to take care of it.

Q. By what means?

A. Well, I think the simplest way is just to go ahead and irrigate a lot of additional land.

Q. Is there any rule or regulation in the Department against the irrigation of grazing lands?

A. You are referring now to Taylor Act Grazing lands?

Q. Yes.

A. No, they encourage the irrigation of Taylor Act land. In fact, two years ago, the Taylor Act, through their CCC Camp at Walden, located four miles north of Walden, did considerable irrigating on an old irrigation project there, and were planning on irrigating a big tract of Taylor Act land lying north and east of Walden.

COLORADO WITNESS MAIN

Transcript Page 23387

Direct Examination by Mr. Warren:

Q. Do you know how many ranches there were in Jackson County in 1938?

A. There were 244.

Q. What was their average size?

A. Something over 1400 acres, on an average size.

Q. What was the average value of these ranches if you know?

A. They had an average value of approximately $12,000.

Q. How do you fix that value?

A. I took it from the agricultural report of the Colorado Planning Commission.

COLORADO WITNESS CHARLES L. PATTERSON

Transcript Pages 24338-24340

Direct Examination by Mr. Warren:

A. Colorado Exhibit 117 is a combination tabulation and graph showing the results of our investigations as to the extent of the irrigated lands in the North Platte River basin in the states of Colorado, Wyoming, and Nebraska.

Q. How are the results of this tabulation indicated?

A. The results of our studies are indicated by figures appearing in a line designated 1939, showing a total of 1,026,050 acres irrigated in the entire stream basin, and showing segregations of that total as between the three states, namely, 136,155 acres in Colorado; 506,540 acres in Wyoming; and 383,355 acres in Nebraska.

Q. That appears at the top line of the tabulation on the right of the exhibit?

A. Yes.

Q. Will you explain the connection between the graph shown at the upper or left side of the exhibit and the tabulation on the right hand side?

A. The same values for each of the states and for the entire stream basin are also indicated by a character resembling a six pointed star located in each case at the end of the lines which refer to each of the three states and to the entire basin. These characters or six pointed stars are located along the line opposite the year 1939, and they are also located with regard to the scale appearing on the bottom or left hand side of the exhibit, in which the irrigated areas are indicated in thousands of acres.

THE MASTER: Does the Nebraska area include the Platte River basin, Mr. Patterson?

THE WITNESS: No, this is strictly the North Platte. There will be an exhibit later to show the main Platte River below North Platte, Nebraska, but all this information relates wholly and solely to the North Platte River basin.

Q. Mr. Patterson, you have mentioned the year 1939 appearing at the top line of figures. Is it true that the relationship there shown between the tabulation for the year 1939 is also shown with the graph and by the tabulation for each of the years from 1880 to 1939?

A. Yes. However, I will say this, that two different methods of study were necessarily applied to the two different periods; that is to say, the present indicated by the values appearing in 1939 were determined by us directly, whereas the values in preceding years, from which those curves were determined, were arrived at in other ways, which will be more fully explained later.

Q. Would you describe generally the methods which were employed to estimate the extent of the irrigated areas in each of the three states?

A. Generally speaking, the method was based upon aerial photographs or aerial surveys, combined with field observations, or what might be termed a cruise of the various tributary valleys and main river sections in which the irrigated lands are located.

Q. Have you heretofore described in detail the methods pursued in determining the extent of the lands irrigated in Jackson County?

A. Yes, we went into that more or less fully in the hearing of May, 1940.

Q. And will you give reference to the particular exhibit heretofore introduced showing the irrigated area in Jackson County?

A. A summary of that investigation of the irrigated

areas in Jackson County appears as Colorado Exhibit 40, and that shows a value of 131,810 acres.

Q. As appears in Colorado Exhibit 117 now before us, what is the total irrigated area of the North Platte River basin in Colorado as of the year 1939?

A. That total is 136,155 acres. I might explain these additional 4,345 acres of irrigated land in Colorado as that part located in the Laramie River basin in Larimer County, Colorado.

Transcript Pages 24877-24878

By the Master:

Q. Your studies testified to at this session have been upon the basis of total water delivered and available in each state, irrespective of the time when such water is available. Is that upon the theory that the proper allocation of water among the three states in this suit should be upon the basis of total water at any time available at each state, thereby in effect charging each state with the obligation of conserving of storage or other waters in that state, so as to afford the greatest possible utilization, or is this testimony directed to any particular theory, or is it just general information?

A. Well, I have tried to avoid any position of being an advocate. I have felt that the figures speak for themselves, and if they are carefully prepared and are before us that then some method of allocation that will avoid overburdening any one state and will protect all the states against the effects of development in the other states could be worked out. However, that is not an engineering matter.

Transcript Pages 24884-24885

By the Master:

Q. Then your approach to the problem is one of taking into consideration the total requirements in each state, and the total water available in each state, which, of course,

entirely eliminates the principle of priority of appropriation?

A. Yes.

Q. You don't recognize that as being a principle that can be taken into account in this case?

A. No. I feel sincerely on that question that any method of defining the relative rights of the states or of imposing on the river a system of interstate administration based upon individual rights would have but one effect, and that would be to force more water down into Nebraska, and to increase rather than to diminish the unconsumed outflows.

And I think it is a very unfortunate concept from the standpoint of peace between these states, because I am sure that if any such a plan were imposed on the river, the enforcement would result in eternal litigation, if not in violence at times. I doubt if it could be said to be capable of enforcement. It sounds nice, and it is perfectly all right among neighbors to agree to that rule of priority, but we find in our own state that while that rule is the foundation of most of our water right values and our land values in this state, nevertheless, as a matter of self-interest and getting the best results we can from the water that is available to us—now, I mean by that both physical and legal—we must do things that constitute violations of that priority rule, and we do them. There are numerous instances of where we have to do them. We have to store the water upstream as far as possible when we can, and take care of the essential needs of those fellows on the same creek farther downstream when that need arises. We let the new development as long as it is reasonable go ahead and store the water. We find that is the only way we can improve our situation.

Now, I would like to make this suggestion, as long as you have asked the question, that I believe the opportunities in the future—and I mean by that thinking perhaps fifty years or more in the future—that remain along this

river are inherently to accrue to the benefit of the State of Nebraska. Now, in my estimation it isn't anything that we should be concerned with how Nebraska might organize her local interests so as to get that benefit. I don't believe that Nebraska has a right to permit large quantities of water to go to waste, and at the same time ask for restrictions upon present users upstream. I think we can concentrate our thinking in this case on the allocations of the remaining opportunities, rather than upon a shifting of vested rights from one area to another.

WYOMING WITNESS NELSON

Transcript Pages 27627-27629

Direct Examination by Mr. Wehrli:

Q. Mr. Nelson, in the experience that you have had in your practice and the studies that you have made, it is not a common situation, is it, where there is a supply adequate on any stream system where irrigation is practiced—an adequate or one hundred per cent supply during all times?

A. There seldom has been. There are conditions which arise because of the incompetency of man to regulate all his works to conform to these climatic conditions which make it impossible at times to deliver just the required amount each month, and such conditions must be faced; that is to say, there can be no guaranty of one hundred per cent supply under all conditions all of the time. Even with a full water supply available for any small portion of the river, that would hardly be true, unless, of course, one hundred per cent control by storage were possible and were made available.

Q. You mean in part, do you not, that conditions from day to day, or week to week, or month to month, will not be forecasted sufficiently accurately in advance to permit the distribution of the supply, even if it were available?

A. That is correct.

Q. Now, is it not a fact, Mr. Nelson, that upon most

streams where irrigation is practiced, the amount of developed land makes it impossible in years of low supply for there to be a complete supply at all times for the developed areas?

A. Yes. That is, if during years of ample run-off, when water was not conserved for use during years of low run-off during heavy drouth periods, the irrigation which had developed were then suddenly deprived of a supply, even in small part, it would be destroyed in behalf of an attempt to give a fuller supply to other rights, during just brief periods of drouth.

Q. Well, is it true that in the ordinary case, or upon the ordinary stream, the development is restricted to only that amount of land which can be supplied in the lowest year or the lowest dry cycle?

A. That would be most uneconomical.

Q. In your opinion, is it economical to restrict development on the upper reaches of a stream to the point where a complete one hundred per cent supply can always be supplied for the lower development on the same stream?

A. No; and it can't be done anyway.

UNITED STATES WITNESS DIBBLE

Transcript Pages 29106-29107

By the Master:

Q. The assumptions are applicable to average conditions, I take it, or intended to be applicable to average conditions?

A. We have taken the average conditions for a period of years during a drouth period as that to which to apply the study. The rules we set up in making the study are in general applicable to all years. I do not assume that the average diversions of water will occur in every year. Climatic conditions materially affect the use of irrigation water from year to year. 1941 is an illustration of that. The deliveries to the land of irrigation water have been rela-

tively small in 1941—on the North Platte project I believe .9 of an acre foot per acre—and yet the project was in position to accumulate some storage. They did not use all the storage water from the North Platte reservoir during 1941. Now, in a study of this kind, that sort of variations must be taken into account, and I think we have, as near as physically possible in this kind of a study, allowed for natural conditions by tying this up to historical points, as far as we could. The thought that we have in mind in general operation is that if the project does not use the full allotment of water that is made in one year, they would be able to establish credit as far as stored water is concerned, or any water is concerned, that can be drawn on at some later time, if the water is available and hasn't gone down the river because of the failure of the use of it. That plan is in operation on many rivers, and works very satisfactorily. Where the storage is great it is an important factor in the ratio. There are a great many little complications that creep into a study of this kind that must be considered and, of course, they must be considered on a basis such that the operating man responsible for the administration of the river can determine the various points and be looking ahead instead of having the advantage of the hindsight that we have in making a study of this kind; it is very much easier to say what could be done after it is done than it is anticipating a situation.

COLORADO WITNESS CHARLES L. PATTERSON

Transcript Pages 29434-29435

By the Master:

Q. The objection to it, particularly in shortage times, is that it proposes such a severe hardship on juniors for the advantage of seniors. Now, if the priority rule was strictly applied in all three states as intrastate system operation, then wouldn't the aggregate of the detriments to the juniors equal the detriment to the Interstate—except for one factor, perhaps, and that is the loss of water through more distant and lengthy transportation, to make an interstate system inoperative.

A. Well, I think in the interstate phase of it we have a situation that simply can not be avoided, that necessarily one state must be upstream from the other. So when you go to considering the aggregate of the individual priorities which one state may have recognized in its citizens as a basis for administering the rights of other individuals in another state that may have been defined under a different procedure, it seems to me that the first step would have to be to extend this hearing indefinitely into the future and bring in the individual enterprises and let each one adjudicate his claims as opposed to the others in the same proceeding; but even then, the inevitable rule works, that to recognize today's shortages under a direct delivery system in downstream area would mean, under drouth conditions or shortage of water supply, taking water away from that upstream user; and you can not get it to turn around and run back up hill if you made a mistake; if, in the meantime, it runs it is gone from him forever, and maybe or maybe not the downstream user will get it when it gets there. So that you do have a greatly magnified situation, by reason of the extreme length of this river, plus the fact that all three states have defined the rights of their individual citizens under different procedures.